

# Coal Age

SEPTEMBER, 1952

A MCGRAW-HILL PUBLICATION — PRICE 50c

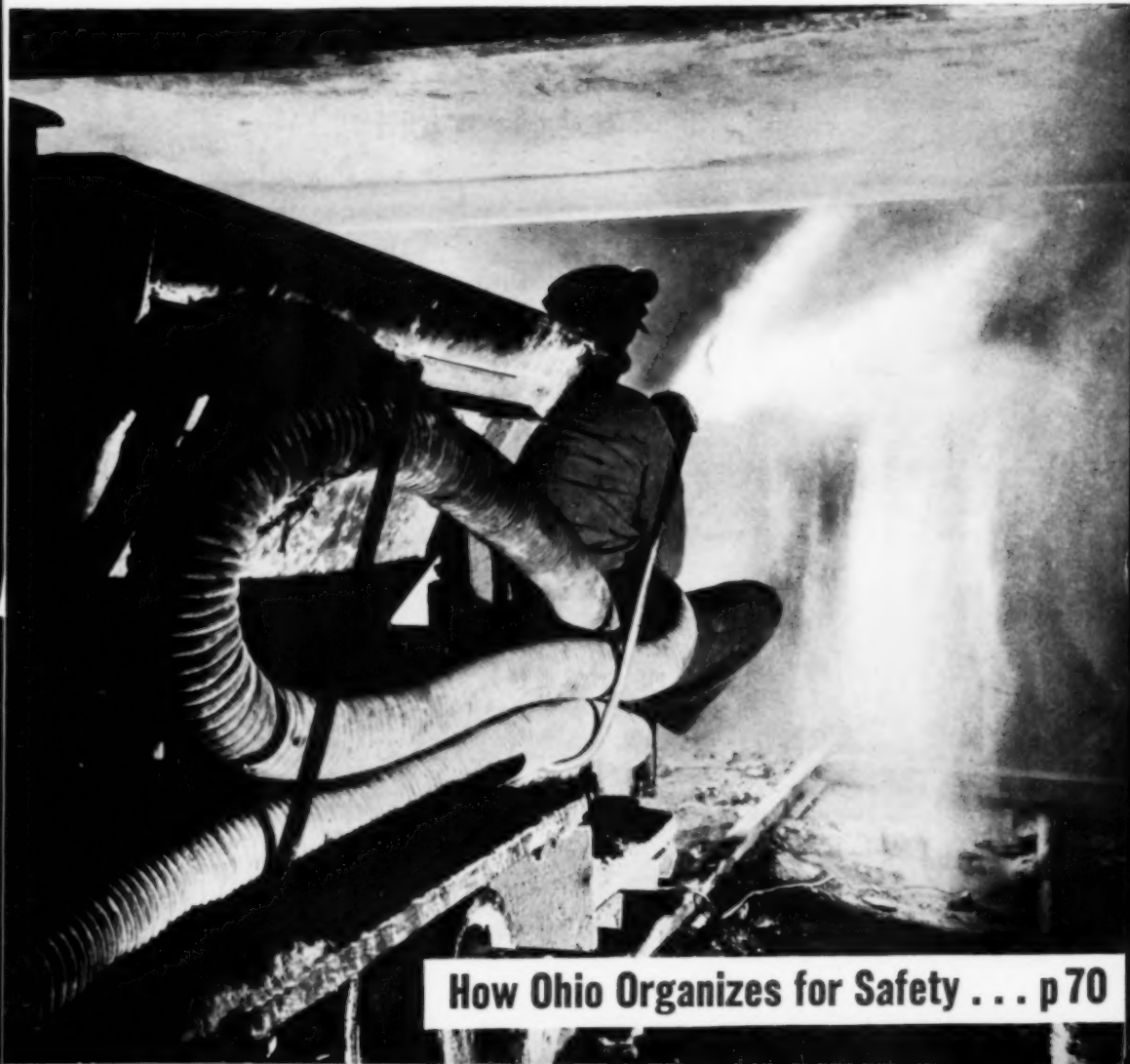
## Mulga Mine Gets Haulage Efficiency

One-third more output with one-fifth the men following haulage modernization. p 76

## Water Saves Tires

Water-filling coal-mining tires extends life threefold; cuts repair costs. p 96

Full Contents on p 5



How Ohio Organizes for Safety . . . p 70

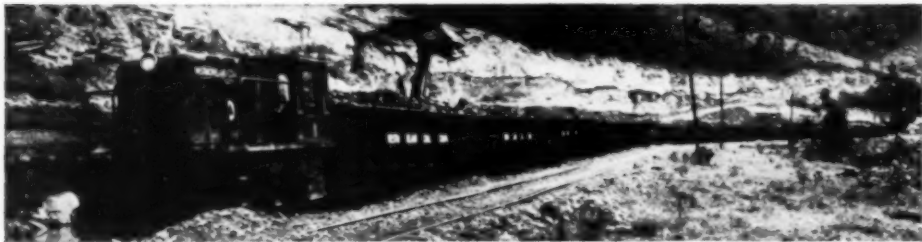
**Q. Any difference in these pieces of Coal?**



**A. Plenty! And the cost of hauling MAKES THE DIFFERENCE**

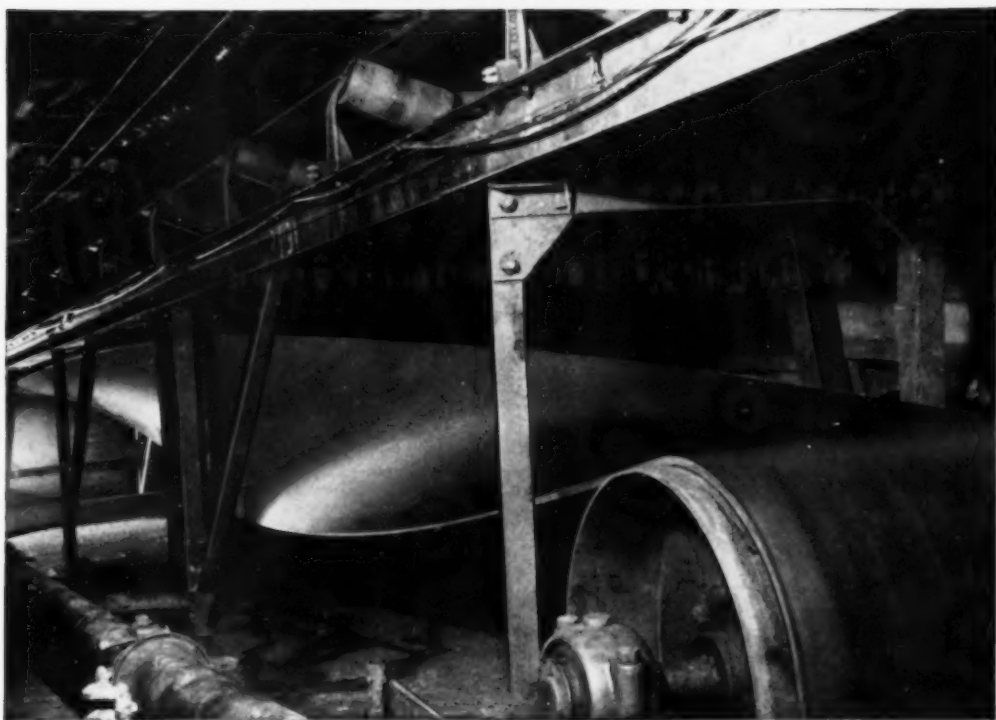
Yes, two identical pieces of coal—mined from the same vein—yet, one piece is costlier than the other. You see, one was hauled by a 'small-load' car—making the load expensive. The other, by an **A.C.F.** economical, 30-ton Mine Car... ideal for mechanized mining. **A.C.F.** mine cars shuttle at high speed—unload on the move automatically. The time saved and tonnage realized means tremendous savings.

If you're planning a new hauling system or overhauling an old one—why pay top dollar for that coal yet to be mined. An **A.C.F.** Representative will be proud to show you the truly astonishing advantages of these large, automatic mine cars. American Car and Foundry Company, New York • Chicago • St. Louis • Philadelphia • Washington • Cleveland • San Francisco • Huntington, W. Va. • Berwick, Pa.



**a.c.f. MINE CARS**  
*for Constant Haulage*





## New "Turnover" belt system announced by B. F. Goodrich

*Carries sticky, freezing, or corrosive material without belt damage*

**O**PERATING nearly half a mile underground, this conveyor belt carries iron ore through a long, narrow mine tunnel. But sticky ore, combined with mine dampness, would cause belts to wear out fast. Wet, sticky particles would cling to the cover, build up into gummy layers, soon clog the return idlers and pulleys, finally damage the belt cover.

Then, last year, a B. F. Goodrich "Turnover" belt system was installed, and for the first time a steady stream of iron poured out of this mine without any costly shutdowns for belt repairs.

You can see how this new conveyor system works. As the ore is dumped off the end of the moving belt, the belt makes a 180° turn, runs empty

along the return idlers, then makes another one-half turn before receiving the next load.

Only the clean side of the belt touches the idlers, so there's no chance for sticky or corrosive materials to build up on them. Even wet materials can be handled at sub-zero temperatures without danger of belt freezing to the rotating metal parts.

With the B. F. Goodrich "Turnover" belt, clean up of spillage is greatly reduced because any material that falls on the lower run of the belt is carried to the end and dumped off when the belt makes its turn. Damage to belt body is reduced because lumps of material cannot be trapped between the belt and pulleys.

Industry will find many other uses

for the new B. F. Goodrich "Turnover" belt—in sugar refineries, fertilizer plants, limestone quarries—everywhere that sticky, freezing or corrosive materials must be moved from place to place. It's easy to convert any conventional system into the turnover type. Your local BFG distributor can show you how the "Turnover" belt can save you money, or write: *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.* (Available in Canada)

*Conveyor Belts* BY  
**B.F. Goodrich**  
RUBBER FOR INDUSTRY

# *Successful because* **Designed to meet**



Some folks call him a hedgehog—some say he's a porcupine. And some opinions are censored. But wherever you find this mild-mannered night-roaming collection of quills, he's always ready for business, always armed for perfect defense; and the hungriest animals give him a wide berth after one experience.

**HULBURT OIL & GREASE COMPANY**  
*Specialists in Coal Mine Lubrication*  
**PHILADELPHIA, PA.**

# specific conditions

*...and it's the same when you think about*

## COAL MINE LUBRICATION

YOU  
MEET  
MINING  
CONDITIONS  
BEST

*with*



**Hulburt** *Quality*  
**GREASE**

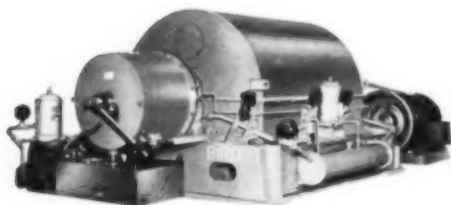
Ask most any experienced coal mine operator about lubricating grease. He won't "hedge" about it. He'll tell you lubrication troubles may "hog" a lot of your profits unless you use Hulburt Quality Grease. Yes, those old "friction devils" give Hulburt-greased coal mining machinery a wide berth because it's got the right kind of protection with the one lubricant made solely to do that one job and do it right. Don't "pine" for the perfect coal mine lubricant—use HULBURT.



## HELP YOURSELF TO

### DRY FINE COAL

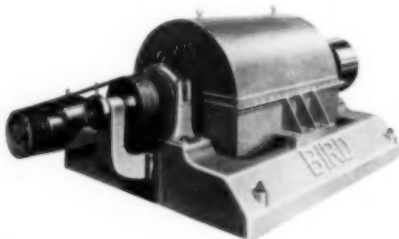
at one third the cost of other dewatering methods.



The **BIRD COAL FILTER** gets fine coal as dry as mechanically possible — a ton or more a minute — at seven cents or less per ton for power, labor, amortization, maintenance — the works.

### CLEANER CIRCULATING WATER

you can close the circuit without building up solids.



The **BIRD POLISHER**, key to a simple clarifying system that delivers clear water for use over and over again without waste or pollution problems. The fine, high ash solids leaving the Polisher are dry enough for removal on a refuse belt.

# BIRD MACHINE COMPANY

SOUTH WALPOLE, MASSACHUSETTS

# Coal Age

## THIS MONTH'S COVER

ADEQUATE ROCK-DUSTING with high-powered late-type machines is but one phase of the successful statewide safety program in Ohio (p 70). Decreasing frequency, severity and fatality rates are proof that day-to-day realistic cooperation between management and union, with the assistance of state and federal officials, is worth the effort. You'll find this a thought-provoking, inspiring story, of particular significance at the present time.

## COMING IN COAL AGE . . .

**Chemicals—A New Boost for Coal?**  
—Why a large chemicals company and a major coal producer are spending millions in separate programs to develop coal's potential in chemicals. Where they're headed and what it may mean to the coal industry.

**Wide-Face Mining of Thin Coal—**  
How Jewell Valley gets high efficiency and greater safety, using a 3-section face conveyor that cuts moving time and reduces resetting of timbers to a minimum.

**Helping Foremen Grow—**Armco has a real program of orienting the foreman into the company and making him a part of management, with plenty of opportunity for self-help and improvement. The company benefits, too, from upgrading the quality of its supervision and development of management teamwork.

**Methane Drainage by Boreholes—**  
A useful digest of European practice and American developments for greater safety—and, in Europe, an income from the gas drawn off.

**The Inverted Trolley—**Follow-up report on the safety and time-saving results at the Lady Dunn No. 100 mine of the Cannelton Coal & Coke Co., Cannelton, W. Va., which has been using the system 3 yr and now has 4 mi in service.

COAL AGE  
VOLUME 57  
(with which are combined The Colliery  
Engineer and Mines and Minerals)

Published monthly on the 1st by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder, Member ABC and ABP. Publication Office: 1209 Noble St., Philadelphia 23, Pa.

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 1221 W. 42nd St., New York 24, N. Y. Curtis W. McGraw, President; Willard T. Chevrolet, Executive Vice President; Joseph A. Gerardi, Vice President and Treasurer; John J. Cade, Secretary; Paul Montgomery, Senior Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Nelson Bond, Vice President and Director of Advertising; J. B. Blackburn, Jr., Vice President and Director of Circulation.

Subscriptions: Address all correspondence to COAL AGE—Subscription Service, 1209 Noble St., Philadelphia 23, Pa., or 1221 W. 42nd St., New York 24, N. Y.

COAL AGE • September, 1952

SEPTEMBER • 1952

<b>Editorial: Still Elbow Room</b> . . . . .	69
<b>Organizing for Safety—</b> W. A. STANBURY, JR. . . . .	70
How mine management and union team up for real results in Ohio.	
<b>How Mulga Modernized for Haulage Efficiency</b> . . . . .	76
More output with less men—another Coal Age "New Methods Report."	
<b>Narrow-Cut Stripping and Calcium-Chloride Washing</b> 80	
High-efficiency mining and uniform-quality preparation for Saxton Coal.	
<b>LO! The Inspector's Weary Life</b> . . . . .	85
<b>Pitch Evolution in Anthracite</b> . . . . .	86
Today's progress and tomorrow's methods in mechanizing anthracite mining.	
<b>Three-Voltage AC Ups Efficiency With Safety</b> . . . . .	90
How Left Fork Fuel uses AC power for new conveyor-loader mine.	
<b>Mulvany and the Ruhr—</b> L. K. MACMILLAN . . . . .	95
<b>Water Filling . . . Tire-Saver for TCI</b> . . . . .	96
Underground tire life three to four times longer, experiments prove.	
<b>Rebuilding for Long-Term Cleaning Results</b> . . . . .	98
Gulf Smokeless modernized its plant to handle both present and future needs.	
<b>What to Do for Better Ventilation</b> . . . . .	104
<b>Tramp-Iron Magnet on Mono-Rail is Easily Unloaded</b> 112	
<b>A 600-Ft Pump Does a Job at Coalwood</b> . . . . .	112
<b>Cement Coating Saves Daily Sealing of Roof</b> . . . . .	114
<b>How to Apply Wire-Rope Clips Properly</b> . . . . .	114
<b>Invention Determines Commutating-Field Polarity</b> . . . . .	116
<b>Safety Hook Holds Coupling Pins in Place</b> . . . . .	117
<b>Coal Separator Features Spiral Design</b> . . . . .	117
<b>Radiator Shutters Promise Better Truck Performance</b> 117	
<b>Foremen's Forum: Death Is So Permanent!</b> . . . . .	106
<b>Equipment News and Bulletins 118 News Round-Up</b> 127	

ALFRED M. STAEHLE, Publisher IVAN A. GIVEN, Editor

W. H. McNeal  
Managing Editor  
Harold Davis  
Assistant Editor

J. H. Edwards  
Associate Editor  
A. E. Flowers  
Assistant Editor

W. A. Stanbury Jr.  
Associate Editor  
F. A. Zimmerli  
Assistant Editor (layout)

G. B. Bryant Jr., Washington

R. W. DAVIS, Advertising Sales Manager

A McGRAW-HILL PUBLICATION



Member of Associated Business Publications  
and Audit Bureau of Circulations

Allow 1 month for change of address. Subscriptions are filled only from management, production and maintenance executives and engineers in the coal-mining industry. Position and company connection must be indicated on subscription orders.

Single Copies: U. S. and possessions and Canada, 50¢; all other countries, \$1.50.

Subscription rates: United States and possessions, \$5 for one year, \$8 for two years, \$10 for three years. Canada \$6 for one year, \$10 for two years, \$12 for three years. Other Countries in U. S. A. Contents Copyright, 1952 by McGraw-Hill Publishing Co., Inc.—All rights reserved. COAL AGE articles are indexed regularly by Engineering Index, Inc. COAL AGE's own index is published annually in December.

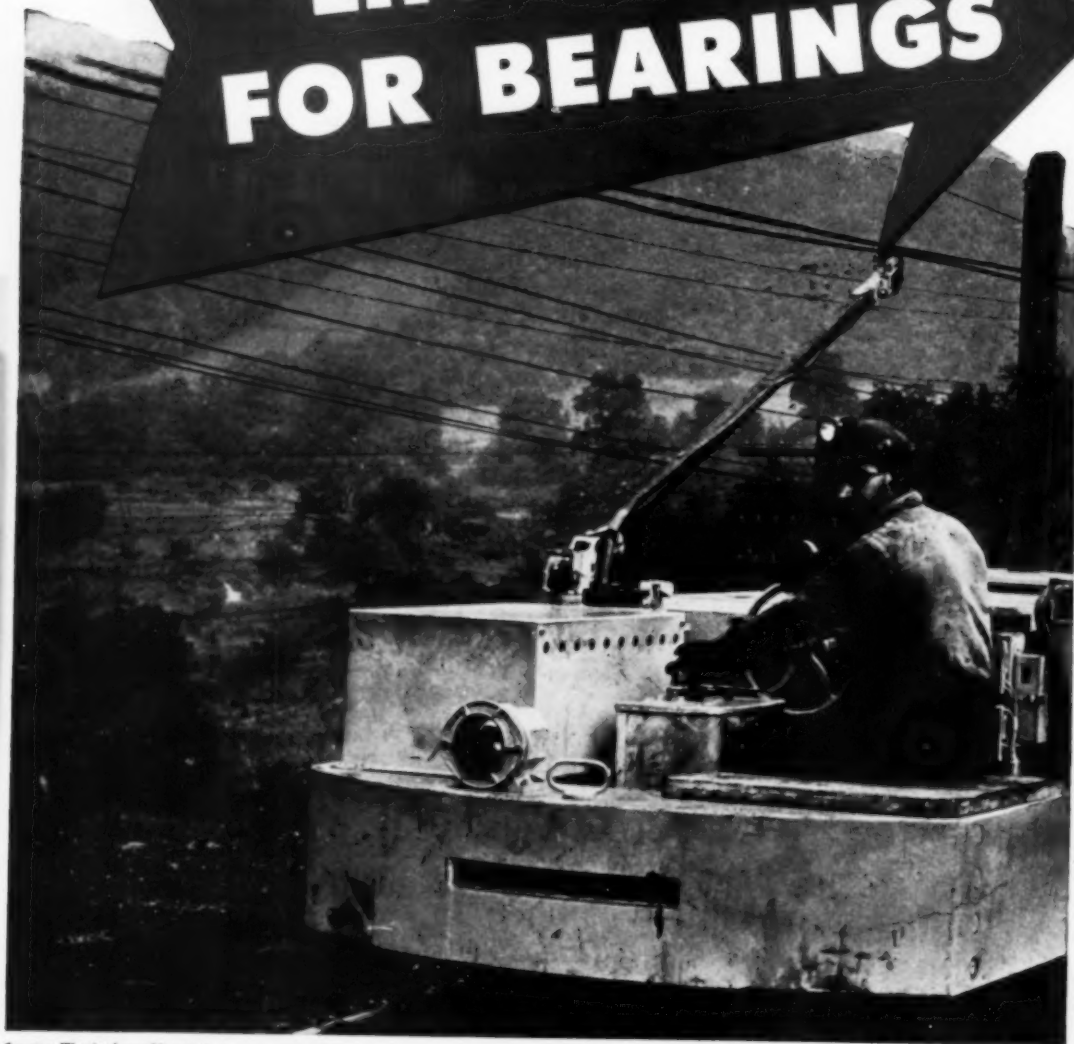
Entered as second class matter Mar 4, 1951, at the Post Office, Philadelphia, Pa., under the Act of March 3, 1879. Printed in U. S. A. Contents Copyright, 1952 by McGraw-Hill Publishing Co., Inc.—All rights reserved. COAL AGE articles are indexed regularly by Engineering Index, Inc. COAL AGE's own index is published annually in December.

Branch Offices and District Managers: Atlanta 2, R. C. Mueller; Chicago 11, C. J. Coash; Cleveland 15, W. M. Sopars; Dallas 1, J. H. Cash; Los Angeles 17, C. W. Dwyer; New York 26, F. E. Alcorn and R. Remond; New York and New England; Philadelphia 3, W. A. Potter; Pittsburgh 23, H. C. Chelton; St. Louis 1, F. W. Rortz; San Francisco 4, J. W. Otter; Boston 10; Washington 4; McGraw-Hill House, 95 Farrington St., London E. C. 4.

World News Offices: London, Paris, Frankfurt, Tokyo, Manila, Rio de Janeiro, Mexico City.



# "LIFE-SAVER" FOR BEARINGS



Courtesy Westinghouse Electric Corp.

**TUNE IN:**  
On television —  
the **TEXACO STAR THEATER**  
starring **MILTON BERLE**.

See newspaper for  
time and station.



## TEXACO LUBRICANTS

# ▶ TEXACO REGAL STARFAK

In locomotives, loaders, cutters, motors—wherever you have grease-lubricated anti-friction bearings—use *Texaco Regal Starfak*. You'll be amazed how much longer your bearings will last, how much lower your maintenance costs will be.

*Texaco Regal Starfak* is premium-quality—outperforms ordinary grease in oxidation-resistance and protective ability. It does not form gum, does not separate in service or in storage. In addition, *Texaco Regal Starfak* eliminates drag on high-speed bearings, keeps bearing temperatures nor-

mal, and stands up under high operating temperatures. It does not leak out—lasts longer.

To keep wire rope strong longer, lubricate it with *Texaco Crater*—the penetrating lubricant that protects both wire strands and hemp core. Use *Texaco Crater* also on open gears. It clings to the teeth, reduces wear and muffles noise. Also available in liquid form—*Texaco Crater X Fluid*—for extra convenience in application.

Let a Texaco Lubrication Engineer tell you more about the many advantages of these and other Texaco mining lubricants. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



## For the Coal Mining Industry

Faithfully yours  
**50**  
for Fifty Years

## Allis-Chalmers HD-20 Tractor

*gives* **HIGHER OUTPUT**—

### Exclusive Hydraulic Torque Converter Drive Is One BIG Reason Why

The hydraulic torque converter drive, *exclusive* in the Allis-Chalmers HD-20 Tractor, brings you productivity, handling ease and dependability that makes every hour, every day of the season count . . . gives the operator the equivalent of hundreds of gear ratios in two speed ranges . . . automatically selects the proper speed for maximum production.

#### Dozing

With hydraulic torque converter drive you take full advantage of available horsepower . . . roll bigger loads, tackle tougher dozing jobs. Master clutch engages under cushioned protection, yet power is achieved *instantly* with velvet-like smoothness. This means fewer repairs . . . longer life of tractor and auxiliary equipment.

#### Pulling

There's nothing like the HD-20 for sheer productive power. Torque converter actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly, and automatically accelerates to highest speed conditions permit, in either high or low range.

#### Excavating

With full horsepower available even at creeping speed, and shifting virtually eliminated, the operator can concentrate on his front-end shovel completely . . . crowd surely and steadily . . . start and stop with a touch of the throttle.

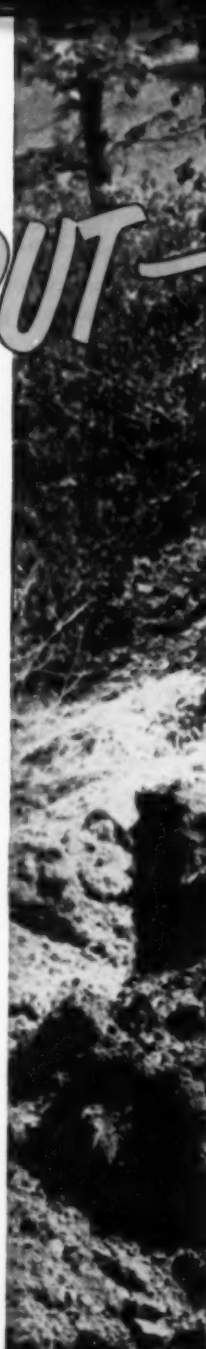
#### Pushing

The HD-20 makes smoother contact, automatically matches speed to pushed equipment, maintains steady contact while loading, sends load off to the fill in a higher speed.

Get the full story now from your Allis-Chalmers dealer. See why the HD-20 does more work, more easily, at less cost . . . and why it is worth waiting for.

**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Weight: 41,000 lb.  
175 Net hp.  
at flywheel

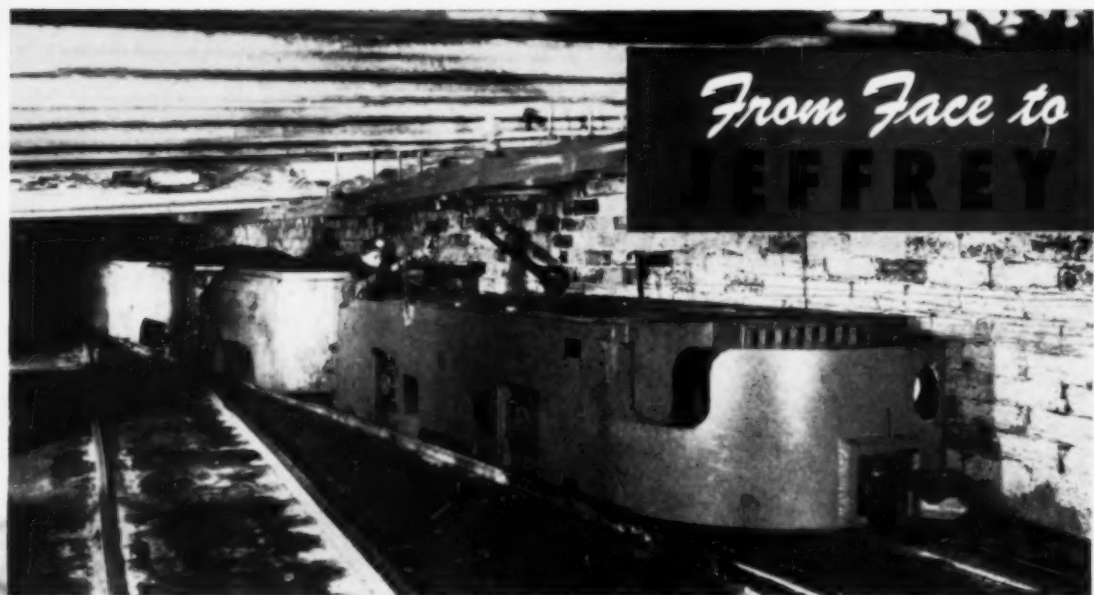


*with LESS UPKEEP*



**Originator of the Torque Converter Tractor**

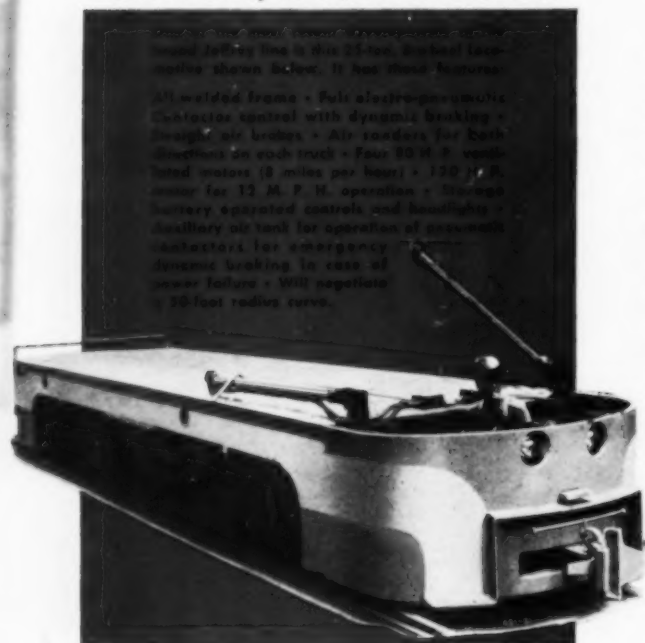




## MAIN LINE LOCOMOTIVES AND...

ABOVE: Jeffrey 15-ton Locomotive

BELOW: Jeffrey 25-ton, 8-wheel Locomotive



Over the years, 75 of them to be exact, Jeffrey Locomotives have been used extensively for the haulage of coal under widely varying conditions. And today, Jeffrey still provides modern, high powered locomotives to speed coal on its way—to meet specific transportation requirements.

All-welded frame • Full electro-pneumatic locomotive control with dynamic braking • Swaght air brakes • Air tenders for both directions on each track • Four 25 H. P. ventilated motors (8 miles per hour) • 120 H. P. motor for 12 M. P. H. operation • Storage battery operated controls and headlights • Auxiliary air tank for operation of pneumatic rockers for emergency dynamic braking in case of power failure • 1000 negotiable • 50-foot radius curve.

Over the years, 75 of them to be exact, Jeffrey Locomotives have been used extensively for the haulage of coal under widely varying conditions. And today, Jeffrey still provides modern, high powered locomotives to speed coal on its way—to meet specific transportation requirements.

Jeffrey Locomotives are available for main line or gathering service in a wide variety of types and sizes. Trolley, battery and cable reel types in various combinations to fit your operation. They can be single units or tandem—four-wheel drive or the most recent eight-wheel, high speed units.

Consult a Jeffrey Engineer . . . he'll be glad to help you work out a transportation system to provide greater production and lower per ton costs.



## Railroad Cars

## EQUIPMENT



## COAL HANDLING EQUIPMENT

Above ground, too, Jeffrey handling equipment is helping production of more and better coal. For example, Jeffrey loading booms, like those shown above, start coal to its various markets in the best condition possible. These loading booms are available in either apron, belt or flight type to suit loading conditions. Each type designed to provide the least possible drop—to reduce degradation to a minimum. Raising and lowering of booms is remotely controlled from a centrally-located control station where movement of all booms can be handled by one operator. Send for details.



Shown left, Jeffrey loading booms discharging coal and rock to road cars. Jeffrey loading booms provide absolute control and accurate handling.

# THE JEFFREY

**MANUFACTURING COMPANY**

Established 1877

912 North Fourth St., Columbus 16, Ohio

Baltimore 2	Boston 16	Cincinnati 2	Detroit 13	Houston 2	New York 7	St. Louis 1
Beckley, W. Va.	Buffalo 2	Cleveland 15	Fifty Four, Pa.	Jacksonville 2	Philadelphia 3	Soft Lake City 1
Birmingham 3	Chicago 1	Denver 2	Marion, Ky.	Milwaukee 2	Pittsburgh 22	

Jeffrey Mfg. Co. Ltd., Montreal, Canada  
 British Jeffrey-Diamond Ltd., Wakefield, England  
 Jeffrey-Galion (Pty.) Ltd., Johannesburg, S. A.  
 The Galien Iron Works & Mfg. Co., Galien and Bucyrus, Ohio  
 Galien (Great Britain) Ltd., Wakefield, England  
 The Ohio Malleable Iron Co., Columbus, Ohio  
 The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio



# Stripping

## at Malayan coal mine

**19 LeTourneau units work  
21 hours a day, 7 days a week**

When the Malayan Collieries in Batu Arang, Selangor, resumed postwar operation, they had to completely re-equip their huge open pit, the only source of coal in the Federation of Malaya. In 1945, they purchased 12 bottom-dump Tournatrailers to haul overburden. These rubber-tired LeTourneau units proved so efficient that when the company wanted to increase output still further, they added 4 rear-dump Tournarockers, 2 Tournapulls, and a Tournadozer to their fleet.

Loaded by shovel or dragline, the rear-dump Tournarockers haul up to 18 tons of oil-bearing shale on each trip to the dump. With a top speed of 35 m.p.h., the Tournarockers make more trips per hour than any comparable haulers.

The Tournapull-Scrapers are equally fast. On typical 1/2-mile hauls, these units average 15 m.p.h. between loading area and dump. Originally, the Tournapulls took 2 1/2 to 3 minutes to self-load to struck capacity (11 loose yds.) in the loose shale. Now, push-loaded by the Tournadozer, the Tournapulls heap 14 loose yds. in 35 to 40 seconds. In other words, load time has been reduced 70 to 80%, while load size has been increased 25%.

In addition to push-loading the scrapers, the fast rubber-tired Tournadozer handles a number of widely-scattered dozing assignments, cleans up around shovels, levels stockpiles, and clears dump areas. Because it drives on rubber tires instead of tracks, this unit does not damage paved surfaces. With 19 m.p.h. speeds, it makes job-to-job moves 3 to 5 times faster than crawler tractors.

All 19 LeTourneau units work 21 hours a day, 7 days a week. Maintenance has been low despite this heavy schedule. Construction of the machines eliminates entirely such trouble sources as crawler tracks, body frames, sub-frames, springs, and complicated hydraulic systems. There are few places to grease, only two types of oil to use.

Compare your present equipment with modern LeTourneau units. Then, to check your profit possibilities, your LeTourneau Distributor will furnish added facts.

# 200 ft.



**Tournapull** is push-loaded to heaped capacity by Tournadozer in 35 to 40 seconds. Once loaded, the Tournapull travels 1/2 mile to dump, spreads and returns 1/2 mile to the cut, all in less than 5 minutes.

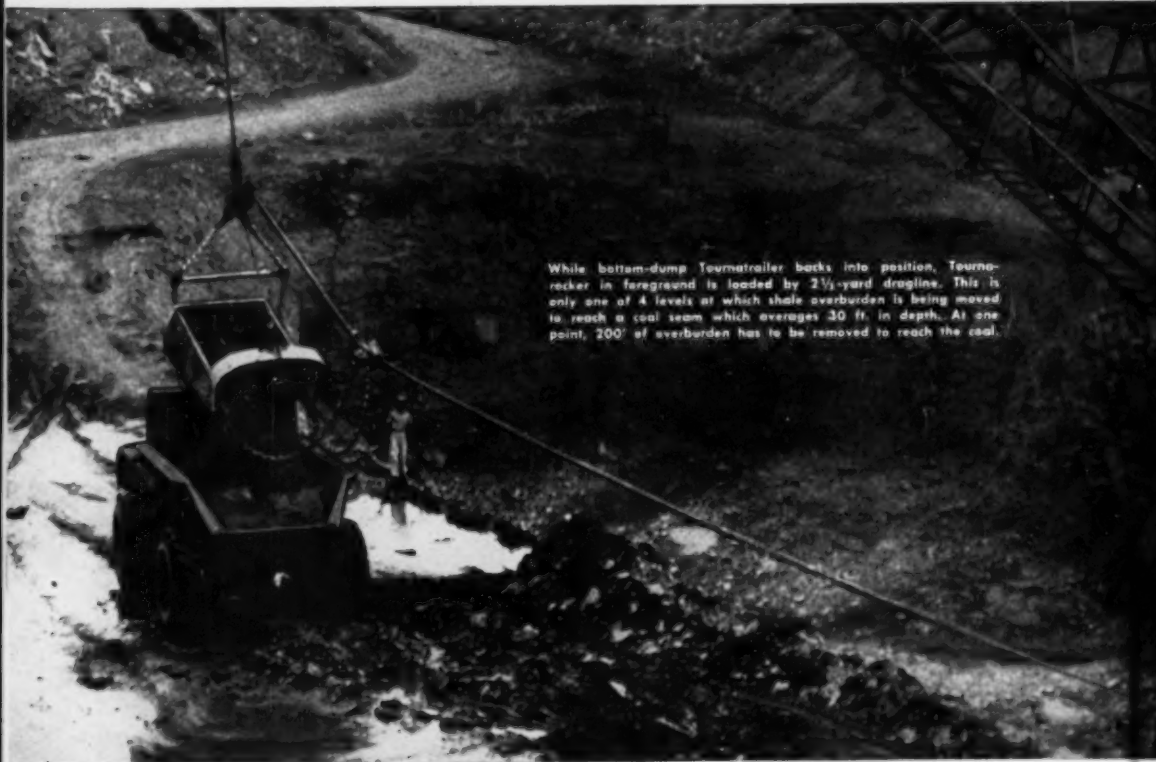


**R. G. LeTOURNEAU, Inc.**  
Peoria, Illinois



FOR 23 YEARS

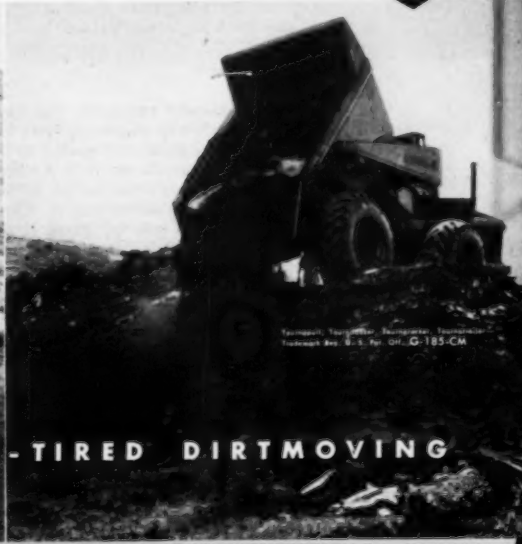
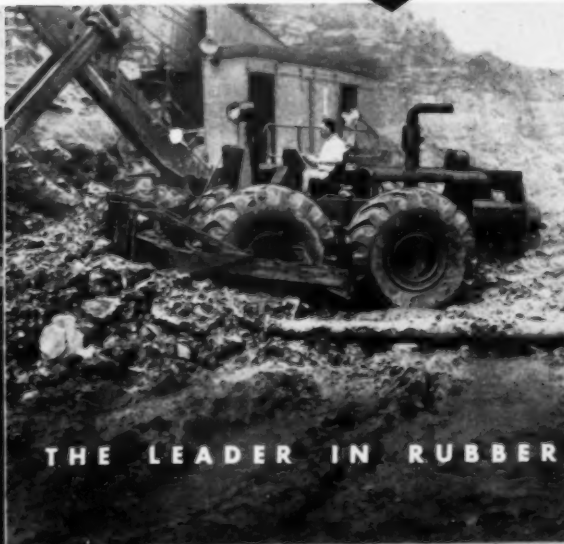
# of shale overburden



While bottom-dump Tourmatrailer backs into position, Tournadozer in foreground is loaded by 2 1/2-yard dragline. This is only one of 4 levels at which shale overburden is being moved to reach a coal seam which averages 30 ft. in depth. At one point, 200' of overburden has to be removed to reach the coal.

**Tournadozer** cleans around shovel; when not busy here, levels dump areas, push-loads scrapers. Its simple electric controls are easy to operate, reduce training time. In 4 min. rig can be at next assignment a mile away.

**Tournarocker** dumps load of shale overburden completely over edge of bank. Unit has been assigned most difficult hauls because of its ability to pull through mud and up steep grades. 13'9" turn radius speeds positioning.



THE LEADER IN RUBBER-TIRED DIRTMOVING

# ***S-D "Automatic" Adequate Surge Bin Are to Low Cost Coal Mining***

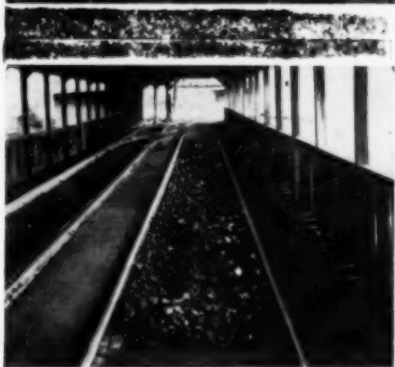
**THIS COMBINATION HAS AS MUCH TO DO WITH CUTTING YOUR MINING AND PREPARATION COSTS AS IT DOES IN REDUCING YOUR HAULAGE COSTS!**

A continuous supply of coal from the face to the preparation plant is absolutely necessary to produce coal at the lowest possible cost. The only dependable way this can be accomplished is through the use of an adequate surge bin which will serve as a temporary storage for coal in transit. The only practical method of filling a surge bin is with Automatic Bottom Dumping Cars. This Surge Bin used with S-D "Automatic" Cars permits your mining operations and preparation plant to function independently of each other. For each to operate at the lowest possible cost, they must be carried on independently:

1. Any cleaning plant works best, and at the least cost, with an even continuous supply of coal. The Surge Bin continues to supply coal to the preparation plant when, for any cause, there is a delay at the face.
2. With an adequate surge bin, one shift operation of cleaning plant is often sufficient to take care of two shift operation of mine. Breakdowns or delays at the preparation plant need not stop mine production because the surge bin will take the coal until repairs are made.

One who has not observed automatic coal haulage cannot visualize the continuity and smoothness of the operation. The cars are loaded and hauled by locomotives in the usual manner. As the trip of cars approaches the head house, they pass over an automatic scale where the coal is weighed in motion. The trip moves on to large surge bin (see top photo at right) where the cars automatically lay down their load of coal without breakage and without hesitation.

S-D "Automatics" haul your coal, non-stop, as it is mined until the surge bin has been completely filled

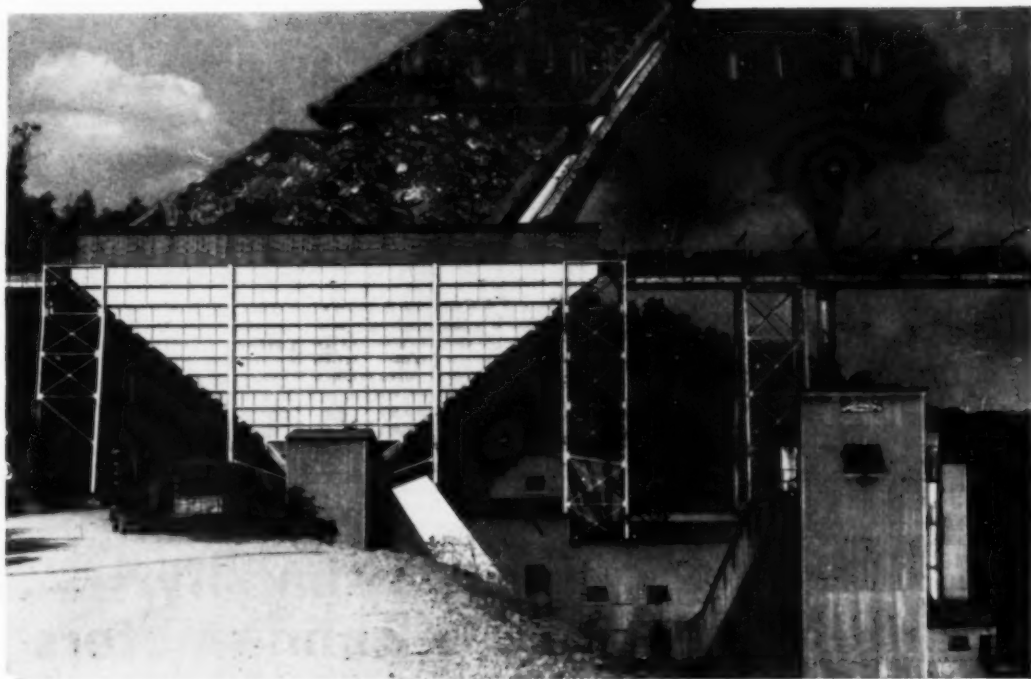


(see lower photo above) and the coal has been automatically leveled with the track from end to end. After dumping, the car doors are automatically closed and the trip runs smoothly back into the mine for reloading. Slate cars are dumped selectively at wells or slate bins enroute. The whole smooth, continuous operation is accomplished without stopping, with the same locomotive coupled to the same cars and with no delay.

The most economical means of filling a bin is with S-D "Automatic" Bottom Dumping Cars. Usually about

## **SANFORD-DAY IRON WORKS**

# ***Mine Cars and an Indispensable Today...***



40% fewer S-D "Automatic" Cars are needed because of constant, on-the-move dumping. This lowers the initial installation cost and, of course, maintenance cost. S-D "Automatics" are sealed against dust leakage, reducing track clean-up costs to the minimum. S-D "Automatics" eliminate all manual dumping. This one item is enabling many operators to save thousands of dollars every year! For example, one operator who installed 16 S-D "Automatics" reported he was saving \$20,000.00 annually by eliminated manual dumping.

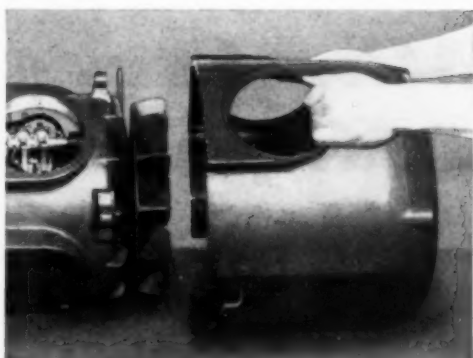
Another operator, who installed 250 S-D "Automatics" reported he was saving \$100,000.00 annually. Those are cold black figures that in some mines mean the difference between profit and loss! The flexibility of S-D "Automatics" offers additional advantages such as: cars are not limited in size . . . top extensions may be added . . . cars with overlapping ends may be used. Investigate the S-D "Automatic" System now! It may pay you in thousands of dollars annually. Write us today!

## **KNOXVILLE 1, TENNESSEE**

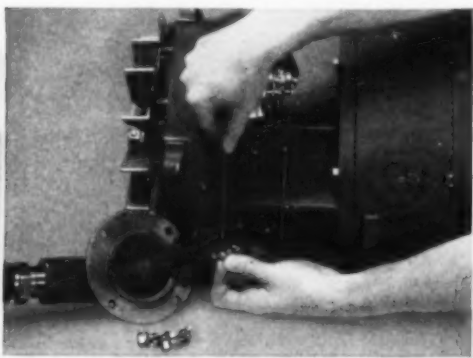




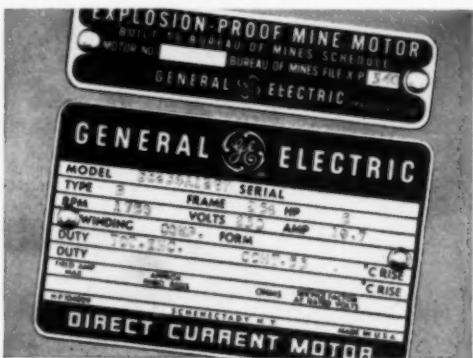
**1. Two-stud construction** permits easy inspection. All brushes are located on the upper half of the commutator where they're readily accessible through large handholes. One-piece, cast bronze handhole covers screw out easily. No special wrenches are needed.



**2. Fan housing slips off quickly.** The external fan and the air chamber can be cleaned without disturbing brushes, end shields or bearings. Just loosen three bolts to remove the cover. Two machined fits assure accurate alignment of the fan housing.



**3. New cable is easily connected** right in the mine. Loosen four holding bolts and the cable gland lifts off to expose motor terminals. Long internal leads and convenient terminals make connection easy. There's no need to dismantle motor or remove it from machine.



**4. Stainless steel nameplate is easy to read,** resists corrosion, permanently bears complete rating, model and serial number. That simplifies identification, servicing, and ordering of renewal parts. Bureau of Mines X/P number also appears on a separate stainless steel label.

## These 4 short-cuts simplify maintenance of new G-E mine motors

**Without dismantling motor, you can check brushes, clean air passages, change cable; ordering renewal parts is easier, too**

Above all, this new General Electric d-c mine motor has been designed for easy maintenance. But that isn't all. It's also built to withstand shock and vibration, combat coal dust and corrosive water. It's specifically designed to occupy minimum space on mining machines. And it's available in ratings of  $\frac{1}{2}$  to 60 hp,

listed by U.S. Bureau of Mines for *any* underground use.

If you're a mine operator, you'll find that powering your machines with these new G-E mine motors results in far lower maintenance costs. If you're a mining machinery manufacturer, you'll earn the good will of your customers—provide your equipment with a big additional sales feature. Bulletin GEA-5553 gives the full story. Write today for your copy to Section 663-23, General Electric, Schenectady 5, N. Y.

GENERAL  ELECTRIC

your continuous mining machine is only  
as "continuous"  
as the cable that powers it!



*Continuous miners produced over 10 million tons of coal last year—and set a record! But it's expensive equipment to lie idle due to faulty cable. Since there's a big difference in cables, it pays to choose yours carefully.*



for longer "break-free" service make sure it's

### Cold Rubber Insulated **Securityflex**



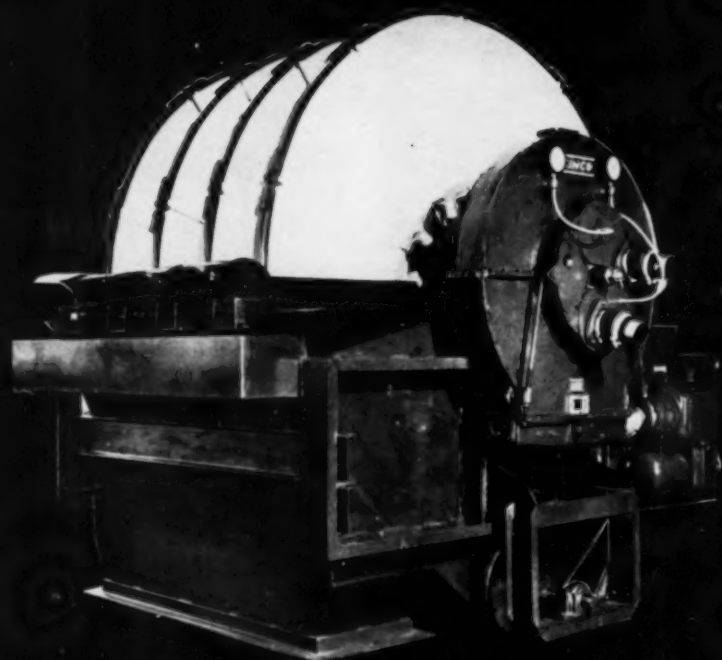
The *only* economical cable is one that can take the toughest job conditions—impact, abrasion, crushing, cutting, heat, and water—and show a consistent record of fewer time-consuming breaks. In this respect Securityflex® is in a class by itself, doubly protected by cold rubber insulation—an Anaconda first—and rugged neoprene jacket. New flat-twin construction won't override, kink, or twist. Patented "anti-short" breaker strip and flat-stranded ground wire offer safety protection to the cable and *safety-first* protection to mine-operating personnel.

This ANACONDA portable cable stands up well under tension, rides the reel easily, passes smoothly over guides, and won't fatigue readily on frequent sharp bends. Your nearest Anaconda Sales Office or Distributor can demonstrate why this sturdy cable will help boost your tonnage and reduce time out for costly repairs. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

52087    ®Trademark

the right cable for the job **ANACONDA®** wire and cable

# SAVE COAL FINES WITH EIMCO AGIDISCS



Saving coal fines will add to your profits. Eimco Agidisc Filters used for dewatering of fine coals assures fast separation of the coal fines from the wash water, efficient drying and maximum production per square foot of filter area.

Eimco filters are heavy-duty machines, built for long continuous service with a minimum of

attention. Experience in machine design for better processing performance has been gained through more than half a century of service to the processing industries. These factors make it easy for Eimco to build you a better filter. Let Eimco explain the use of this simple, efficient machine that will quickly pay for itself in product saved.

*You Can't Beat an Eimco*

## EIMCO<sup>A397</sup>

THE EIMCO CORPORATION

The World's Leading Manufacturer of Vacuum Filtration Equipment  
EXECUTIVE OFFICES AND FACTORIES - SALT LAKE CITY, UT, U.S.A.

BRANCH SALES AND SERVICE OFFICES:

NEW YORK: 51-52 SOUTH STREET • CHICAGO: 2319 SOUTH WALLACE STREET  
BIRMINGHAM, ALA.: 3140 FAYETTE AVE. • DULUTH, MINN.: 21A E. SUPERIOR ST.  
EL PASO, TEXAS: HILLS BUILDING • BEREKLEY, CALIF.: 837 CEDAR STREET  
KELLOGG, IDAHO: 107 DIVISION ST. • LONDON W 1, ENGLAND: 190 PICCADILLY

IN FRANCE: SOCIÉTÉ EIMCO, PARIS, FRANCE

IN ENGLAND: EIMCO GREAT BRITAIN LTD, LEEDS 12, ENGLAND

IN ITALY: EIMCO ITALIA S.P.A., MILAN, ITALY

# TEXROPE

Widest Range  
V-Pitch Drives



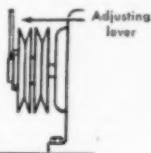
## 1 Magic-Grip Mounting

The widely used *Magic-Grip* tapered bushing is now supplied with the Wide Range *Vari-Pitch* sheave, making it the fastest mounting sheave of its type on the market. Turning only one screw makes or breaks the vise-like grip of sheave bushing on motor shaft.



## 2 Fast Adjustment

To change sheave diameter — thereby changing speed — simply turn a single adjusting screw, using a lever rod that slips through a hole in the head of the screw. No more fumbling with screw drivers. Adjustment is fast and accurate.



## 3 Adjusts From Either Side

Sheave can be mounted on motor shaft so adjusting screw is either toward or away from motor bearing, as indicated above. This feature is especially important in installations where space for adjustment is limited. It's the only sheave of its type with this feature.

Texrope, Vari-Pitch and Magic-Grip are Allis-Chalmers trademarks.

# ALLIS-CHALMERS

A stationary control sheave for use with Q or R section belts on 1½ to 30-hp drives.

# NOW!

## Wide Range

## Vari-Pitch Sheave has

## 3 New Advantages

GET COMPLETE DATA FROM YOUR NEARBY ALLIS-CHALMERS DISTRIBUTOR OR DISTRICT OFFICE, OR SEND COUPON.

ALLIS-CHALMERS  
MILWAUKEE 1, WIS.

Send me complete specifications and engineering data on the new Wide Range *Vari-Pitch* sheave . . . 2057811.

Name


Title

Company

Street

City  State  A-3841





## Steady power for a hungry bucket

That 5-yd. bucket, swinging high from a Manitowoc Speedcrane's 120-ft. boom, needs plenty of power to keep it biting. Stripping overburden in a Pennsylvania anthracite field, it hacks through 10 ft. of dirt and 60 to 70 ft. of shot-hard rock to get at a vein of coal 8 to 10 ft. thick. And it draws its power from a "Caterpillar" Diesel D386 Engine, on the job 16 hours a day, 12 months a year.

"We're extremely pleased with the operation of this engine," says J. Futch & Son of Pittston, Penna., an outfit that knows the importance of dependable dragline power. "Cat" Diesel Engines have dependability and long life built right in them. One example: all crankshaft bearing surfaces are "Hi-Electro" hardened and Superfinished for extra years of steady performance. Available in 12 sizes up to 500 HP, these Diesels

are honestly rated. Remember, an engine that has to strain to reach its horsepower rating is asking for expensive breakdowns, frequent overhauls and higher maintenance costs.

Your nearby "Caterpillar" Dealer can give you the full story on the dependable power that's packed into every "Cat" Diesel Engine. Why not see him soon?


CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

# CATERPILLAR

REG. U. S. PAT. OFF.

**DIESEL ENGINES  
TRACTORS • MOTOR GRADERS  
EARTHMOVING EQUIPMENT**





The reliable machine  
you see everywhere...  
Work-horse of the  
medium thin veins!

# JOY 14-BU LOADER

In medium vein mining—36" to 60"—more coal is loaded by JOY 14-BU's than all other loaders combined. Unmatched durability, through advanced, simplified design, has made the 14-BU the world's most widely used loader. There are less than one-third as many wearing parts, and only half as many points of lubrication, as on comparable machines.

Breakage of the gathering mechanism, or any failure other than by normal wear, is virtually unknown on the 14-BU. The rigid design of the gathering head provides a compact and very strong construction. "Tight" shots and corners can be loaded out quickly and easily without fear of damaging the loader.

Because of the long tread-to-length ratio, which reduces pitching while tramming, the 14-BU requires minimum roof clearance on rolling bottom.

Exclusive Magnetax control permits easy, positive, one-man operation. The rear roller-shaft is considerably oversize, to combat tail-conveyor damage. Like all assemblies of the 14-BU, it is readily accessible for easy maintenance.

The Joy 14-BU is produced in heights of 30½", 33", or 36", and will load up to 8 tons a minute.

● Let us show you how JOY Loaders and other mining equipment can increase *your* production and profits—no matter what your conditions may be.

*Consult a  
Joy Engineer*



W&D CL 3992

## JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

# In BELT CONVEYORS JOY

## has what you need



Complete selection of sizes and  
types to meet any operating condition and requirement  
underground or above ground

Joy Belt Conveyors—lifelines of the mining industry—furnish capable, low cost transporting systems for gathering, main line or slope work.

Heavy, pan-type sections, 8', 9', 10' or 12' long, are bolted together to form extremely rigid, dependable units. Idler rolls are equipped with either sealed, precision bearings which require no lubrication; or heavy duty, grease-type roller bearings.

Drive pulleys are covered with vulcanized-rubber lagging for maximum bonding between pulley and lagging. Motors and reducers are correctly matched to power re-

quirements, with ample allowance for the service factor at peak load.

Intermediate sections are produced in a wide range of styles and sizes, some of which are illustrated at right. They're built for maximum strength and portability with minimum weight.

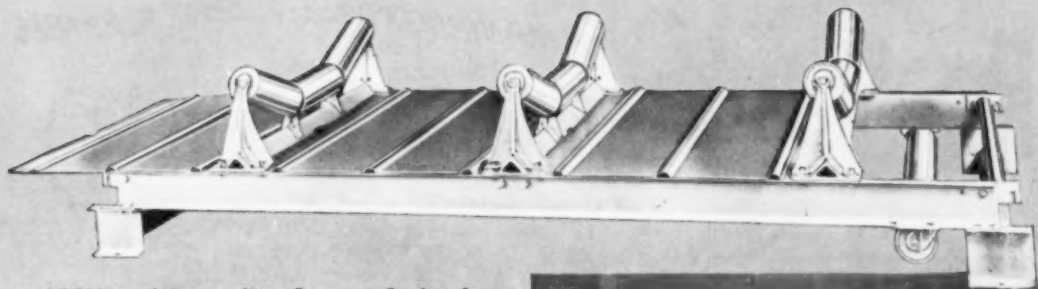
JOY is the world's only manufacturer of both tandem-pulley drives and direct-connected, totally-enclosed, single-pulley drives. A Joy Engineer, therefore, can unhesitatingly recommend the proper type of conveyor to fill YOUR needs. • Write for JOY Belt Conveyor Bulletin No. LD-100.

Write our Film Booking  
Office for Free Showing of  
"TRACKLESS MINING IN COAL,"  
a 16 mm, full color, sound  
movie, 45 minutes long.

# JOY

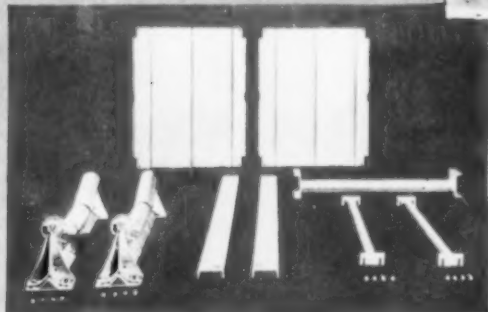
WORLD'S LARGEST MANUFACTURER OF  
UNDERGROUND MINING EQUIPMENT

See the JOY Film, "SULMET  
TUNGSTEN CARBIDE BITS", 16  
mm, sound, full color, 12  
minutes viewing time. Write  
our Film Booking Office.

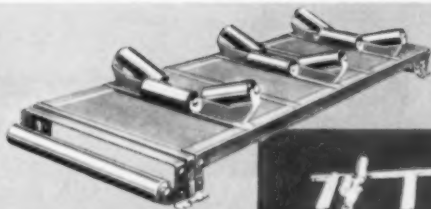


**ABOVE:** 12' Intermediate Conveyor Section for very heavy duty. Unit is knockdown type, for use with 48" belt. For additional strength, cover sheets are corrugated—stringers are of 6" channel steel. Cross pipe spacers, which drop into place without bolts, rigidly brace the section and hold it in alignment. The cover sheets lap under the troughing idler base angles to prevent leakage. Belt idlers have grease-type bearings as standard equipment, but can be furnished with sealed, precision bearings.

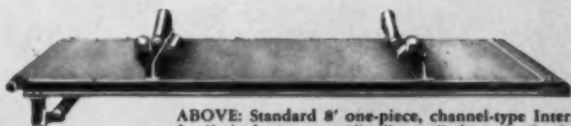
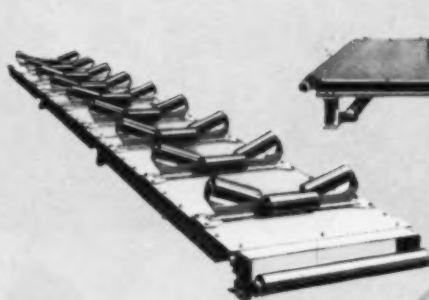
**RIGHT:** 8' Intermediate Conveyor Section, similar in design to above, for use with 42" wide belt. This unit can be knocked down into easily handled pieces, as shown, for easy transportation.



**RIGHT:** 9' Intermediate Conveyor Section of knockdown design. Can be furnished for 26-30-36-or-42" belts. Belt idlers have sealed, precision bearings. Cradle is heavy, die-formed, ribbed pressed steel. This is a heavy duty unit of minimum height—15 3/4" to 18 3/4"—for use in thin-seam mining.



**RIGHT, BELOW:** Similar style in 8' length. Note that the only bolts used in joining are those which anchor the troughing idler brackets to the side rails.



**ABOVE:** Standard 8' one-piece, channel-type Intermediate Section for limited tonnages. 3", 4", or 5" channels. Sections are self-contained with cross pipe-spacers welded between channels. Pivotal section connection. Section connection made without bolts or loose parts of any kind.

**LEFT:** Three 9' sections joined together. Each is of one-piece, welded construction. Side rails are 5" steel channels. Ribbed pressed steel cradle. Pivotal section connections. For 30", 36" (illustrated), or 42" belts.

*Consult a Joy Engineer*

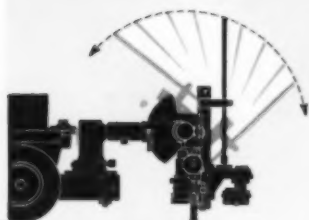
W.D. CLAYTON

# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

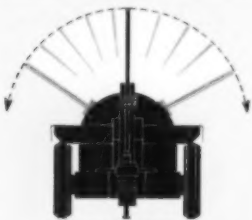
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO





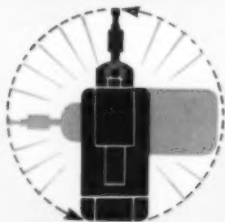
**SIDE VIEW**

Full-swiveling frame permits forward-backward angling . . .



**FRONT VIEW**

. . . and full side tilting to any angle normally desired.



**TOP VIEW**

Tractor type steering lets the RBD-10 turn in its own length.

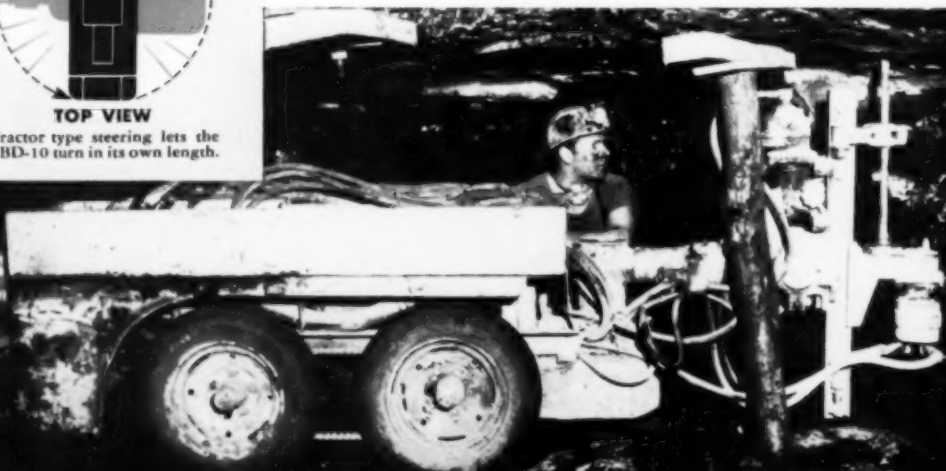
**HIGHLY MANEUVERABLE • HIGHLY FLEXIBLE**

# JOY RBD-10 ROOF BOLTING DRILL

The RBD-10 was designed expressly for high-production roof bolting in restricted areas where small size and high maneuverability are **MUSTS!** Its dimensions are a bare 31" high, 36" wide and 106" long. With a unique tractor-type steering, it can actually turn in its own length or be "inched" into exactly the right position for drilling.

In addition, the drilling mechanism is mounted on a full-swiveling frame. *You can drill at any angle you desire*, regardless of pitching seam or rolling bottom. A central hydraulic system, powered by a 10 or 15 H.P. hydraulic-pump motor gives effortless one-man control of tramping, steering, drill feeding, and drill rotating.

Yes, the Joy RBD-10 Roof Bolting Drill will do a *real* job for you, in places other machines can't even get near . . . and it will do it faster and easier.



Photograph illustrating the ability of the RBD-10 to "worm" around obstacles and operate in restricted space.

*Consult a Joy Engineer*



## JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO



# THIS IS THE DIESEL

for any mining job from 32 H.P. up

Whatever your mining job, there's a General Motors Diesel to supply the power. For General Motors Diesel engines now power more than 350 different models of mining equipment built by over 50 manufacturers.

Widespread demand for the 2-cycle GM Diesel engine results from its ability to get more work done faster and at lower cost. GM Diesel's fast acceleration boosts production. Smooth 2-cycle

operation reduces wear and extends engine life. Convenient location of accessories simplifies maintenance. What's more, GM Diesels definitely cost less to maintain and repair because parts cost less, are highly interchangeable and are available everywhere. See your GM Diesel distributor or write us for full information.

**DETROIT DIESEL ENGINE DIVISION**  
GENERAL MOTORS - DETROIT 26, MICHIGAN  
ENGINE DISCOUNTS... 32 to 271 H.P.    400-7155 DIESLS... 312 to 640 H.P.

*It pays to Standardize on*

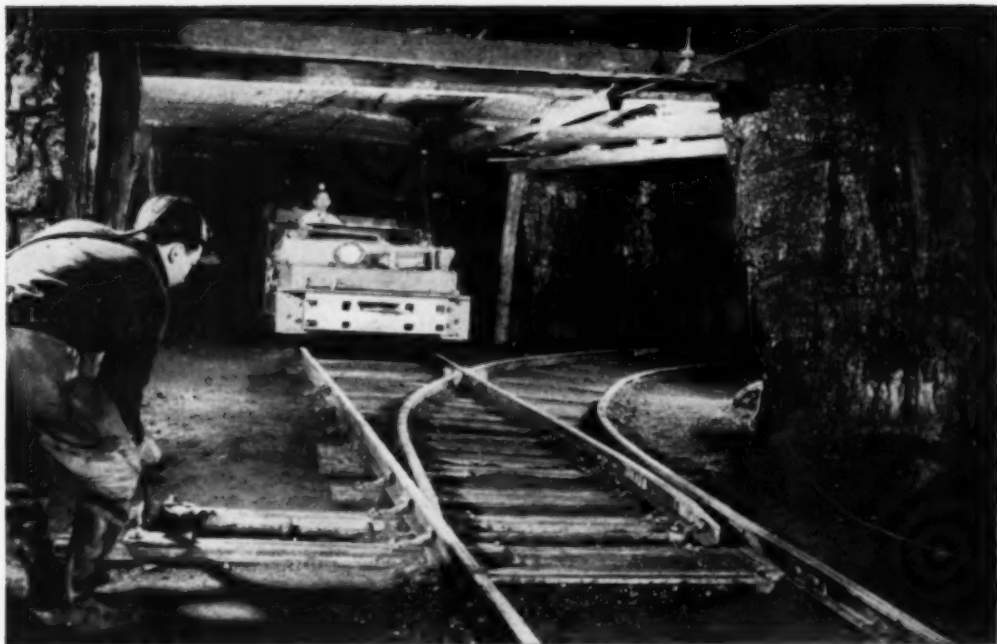
Write for booklet, "A 100,000,000 Shareowner Insurance Policy" that tells you why.



**SEE OUR EXHIBIT AT THE MINING SHOW**

BOOTHS 1305, 1309, 1311 (Aud. Floor)





## Complete to the last bolt



When Bethlehem designs a prefabricated track system, it's a complete job down to the last bolt and nut. There is nothing else to buy. Even the turnouts are complete in every detail, with all necessary prefabricating done before shipment.

A Bethlehem layout includes rails, switch stands, switches and rods, steel ties, rail braces, frogs, guard rails, and even the small items like joint bars and fastenings. The outfit comes to you ready for quick assembly. Rails are precut to proper lengths, precurved to proper radii, cut and curved to meet the requirements of your individual mine.

Because the system is complete, and because many parts of it are prefabricated at the factory, it can be installed easily and with only a minimum of supervision. Track crews—even green hands at the job—need little instruction. Assembly is simplified by numbered rails, which are keyed to equivalent numbers on blueprints of the layout.

Ask for the full story of Bethlehem prefabricated track. It can do a lot for your haulage system—much more than we can possibly tell you here. Whenever you say, a Bethlehem engineer will gladly call with detailed information.

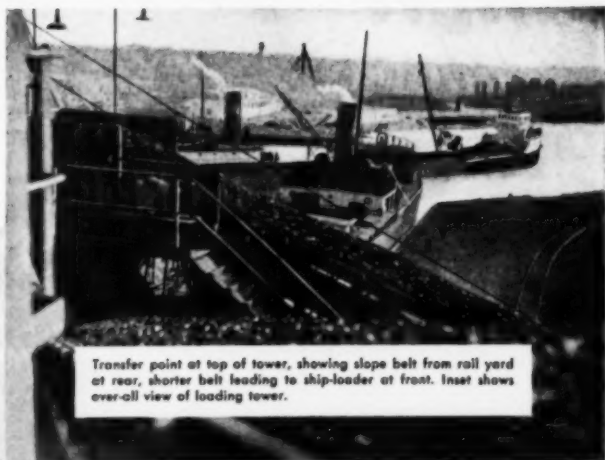
**BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.**

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

## BETHLEHEM PREFABRICATED TRACK

# Tripled Handling Capacity

—without changing equipment!



Transfer point at top of tower, showing slope belt from rail yard at rear, shorter belt leading to ship-loader at front. Inset shows over-all view of loading tower.



THIS coal-handling system — used to transfer coal from cars to Great Lakes shipping—originally handled 620-750 tph of coal. It was belted by the G.T.M.—Goodyear Technical Man — with 6-ply Style B Goodyear Conveyor Belts.

Today, *without changing equipment in any way* except increasing belt speed, this system is handling 2,100 tons per hour—has handled as much as 32,000 tons per day and a five-year total of over 7,000,000 tons of coal!

The belts have been able to do this for two reasons — Goodyear job-designed belt construction, and good maintenance at all times by the operators of the facility.

LOOK FOR YOUR GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods." He handles Hose, Flat Belts, V-Belts, Molded Goods, Packing, Tank Lining, Rubber-Covered Rolls built to the world's highest standard of quality.

# GOODYEAR

THE GREATEST NAME IN RUBBER

# NEW

**Cedar Rapids**  
Built by  
IOWA

*Schrock*

# Motorized

## HEAD PULLEYS



**SIMPLIFY EVERY BELT CONVEYOR  
AND BELT-BUCKET ELEVATOR  
INSTALLATION**

**IT'S COMPLETELY DIFFERENT FROM  
CONVENTIONAL CONVEYOR DRIVES**

*Everything* is contained **INSIDE** the pulley!

### WHAT A *Motorized* HEAD PULLEY IS

**ELIMINATES ALL MAINTENANCE ON  
SPROCKETS, CHAINS, JACK-SHAFTS,  
V-BELTS, ETC.**

THIS is a revolutionary departure from the conventional types of conveyor drives. A motorized head pulley is a fabricated steel pulley with *everything*... electric motor, reduction gears and all moving parts... contained inside the drum! It's simply a new application of the long-proven gear reduction drive, and because of its simplicity, it's the answer to the maintenance man's prayer. 70% to 90% of conveyor down time is saved by eliminating all countershafts, speed reducers, sprockets, chains, Universal shaft drive and other parts necessary with conventional pulley drives. Motorized Head Pulleys are simple to install and flexible in use, completely interchangeable and adaptable to all types of belt and belt-bucket conveyor installations. By means of a simple adapter, a single pulley can be utilized in any of several belt locations, operating various widths of belt, or changing from larger or smaller horsepower. Pulley sizes range from 5 to 30 HP and are available in various widths. A Motorized Head Pulley is safe, because there are no sprockets, chains, jack-shafts, V-belts, etc. to endanger personnel. It's compact... requires no more room than a conventional pulley. Complete protection from weather, grit and dirt also reduces maintenance. Cedarapids Schrock Motorized Head Pulleys have been job-tested for many years under severest working conditions.

U.S. Pat. No.  
2548399  
Others Pending

### HOW IT WORKS

The pulley shell rotates about the electric motor, which is held stationary by means of a torque arm attached to the conveyor frame. The speed of the shell depends upon the combined reduction ratio of the various pinions and gears contained within the pulley shell. This reduction starts with a primary pinion mounted on the motor shaft and ends in the ring gear attached to the shell. The shell in turn then drives the conveyor belt. Leads to the motor enter the head pulley through a hollow conduit passing through the drum end bell and bearing. A simple oil bath gear compartment provides a lubricating bath for the reduction gears and front motor bearing. Motor and head pulley are cooled and ventilated by holes in the drum.

### GET COMPLETE DETAILS TODAY

Find out all the advantages of converting your conveyor installations to motorized efficiency before you need head pulley replacements. One internationally known company has 50 Motorized Head Pulleys installed on widespread conveyor operations, and plans more for every installation that requires replacement. Get complete details about every feature. See your distributor today, or write direct to Iowa Manufacturing Company.

**IOWA**  
**MANUFACTURING CO.**  
Cedar Rapids, Iowa, U.S.A.

**Western Sales:**  
**YUBA**  
**MANUFACTURING CO.**  
351 California St., San Francisco 4, Calif.

# 6½-ton shuttle car rolls, steers and drives on TIMKEN® bearings

**T**HIS Goodman Manufacturing Company type 580 shuttle car hauls as much as 6½ tons of coal at a time from mine face to mine entry. To insure against costly breakdowns in the mine and help the car stand up under the back-and-forth, day-after-day wear and tear of heavy-duty mine operations, Goodman uses Timken® tapered roller bearings on drives, steering knuckles, wheels and conveyor drives.

Timken bearings on the drives and steering knuckles carry both radial and thrust loads, holding shafts in

proper alignment. Drive gears mesh smoothly and accurately, gear wear minimized. Wheels roll easily, effortlessly. And steering's easier, reducing operator fatigue.

Line contact between the rollers and races of Timken bearings provides more than enough capacity for the heavy loads. True rolling motion and incredibly smooth surface finish of Timken bearings reduce friction, reduce wear.

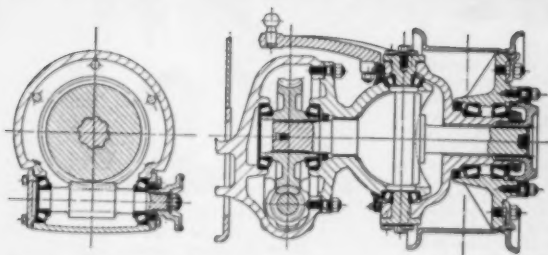
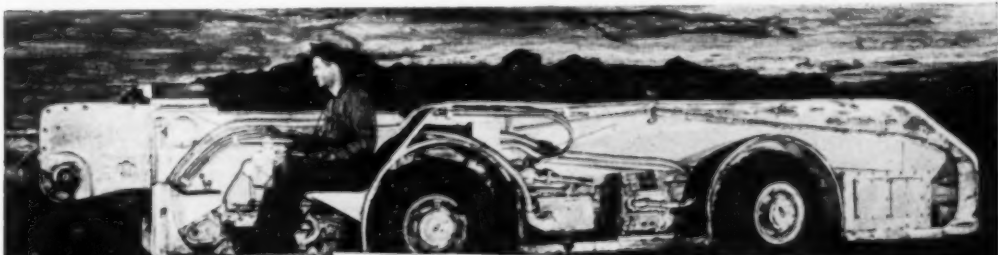
Because they hold shafts and housings concentric, Timken bearings make closures more effective. Dirt,

coal dust and moisture are kept out, lubricant kept in. Maintenance costs reduced.

No other bearing can offer you all the advantages of Timken bearings. Be sure to specify them for the machines you build or buy. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



*This symbol on a product means its bearings are the best.*



**How GOODMAN MANUFACTURING COMPANY mounts the drives steering knuckles and wheels of its type 580 shuttle car on Timken tapered roller bearings.**



## GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

**TIMKEN**  
TAPERED ROLLER BEARINGS



NOT JUST A BALL ☐ NOT JUST A ROLLER ☐ THE TIMKEN TAPERED ROLLER ☒ BEARING TAKES RADIAL AND THRUST ☐ LOADS OR ANY COMBINATION 

# THESE MEN\* HAVE THE ANSWERS that cut coal cutting costs



**RANDAL LEACH** began his career with the electrical crews at South East Coal while in high school. After two years at Lees Jr. College at Jackson, Kentucky and two at mechanical and electrical engineering at University of Kentucky, he returned to that firm; joined the Bowdil organization in 1937. Covers the Middle West, lives at 1004 East St. Louis St. in West Frankfort, Ill. Telephone 675.



**V. L. WALKINGTON's** advancement of chain lacing ideas have overcome many Western conditions. In 1938, when Vic joined Bowdil, he brought a fine record of 25 years electrical welding, drafting and laying-out experience. Lives at Helper, Utah, covers Utah and part of Western Colorado.



**E. D. AUDILL** was schooled in mining and electrical courses in Kentucky, is certified for Mine Foreman in Kentucky and West Virginia. Ed came with Bowdil in March 1937, covers Southern West Virginia. Address Box 132, Danville, West Virginia, you reach him by telephone 336 W. Madison, West Virginia.



**JOS. M. BLASCO** brought a lifetime of mining knowledge to Bowdil when he became a representative in May 1933. A graduate of L. C. Cook Engineering School, Chicago, Joe almost completed the I. C. S. course in Engineering, too. He covers Pennsylvania entirely, calls Charleroi, Pa. home, where his residence is at 435 McKean Avenue, and the phone Charleroi 34628.



**WILLIAM D. RADCLIFFE** went west from Kentucky, stopped to learn his trade at Chicago School of Electrical Engineering . . . then on to Sheridan, Wyoming in 1901 as Chief Electrician for the Carnie Coal Company where he installed the first electrical mining machine in the area. Another first was the electrical machine at Roundup, Montana for the Milwaukee R. R.'s Republic Coal Co. Joined Bowdil in 1932; covers the Rocky Mountain Area including Colorado, New Mexico, Montana, North Dakota and Wyoming. Customers in the West enjoy the Radcliffe's hospitality at 761 Steele St., Denver, Colorado. Telephone EA-7151.



**C. W. (PETE) WEISBURN** earned his first State of Ohio Mine Foreman papers after three years in Mine Engineering at Ohio State University. A veteran of all types of mine operation, Pete joined Bowdil in 1945, covers Ohio and into West Virginia direct from the Canton factory—not far from his home in Magnolia, Ohio. Telephone Magnolia 2166.



**A. J. LEACH** began his mining days with a pick, then operated the first Breast Machines to come to the Tom Corwin Coal, Company at Wellston, Ohio, and Superior Coal at Jackson, Ohio in 1900. Has operated machines in all types of seams in Ohio, Kentucky and West Virginia with a rich background of experience from 3 years as Mine Foreman and 15 as Superintendent of South East Coal Company at Seco, Kentucky. Joining Bowdil in July 1933, Leach covers Eastern Kentucky, lives on Sand Lick Road in Whitesburg. Telephone 2232.

## BOWDIL CUTTER BAR

Bowdil Cutter Bars are designed for extra strength and power saving. Rivet-free body, Z bar construction, wide wearing strips make it the sturdiest bar in mining. Bowdil Bars are standardised to fit all coal mining machines.



## FABRI-FORGED CHAIN

Lower your operating costs with Bowdil Fabri-Forged Chain. Rugged, easy to maintain, the drop-forged lug body stands up under heavy wear with breakage practically eliminated. A major improvement is the true-running radial track guide.



# The BOWDIL COMPANY

CANTON, OHIO



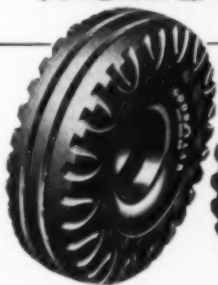
# **BRAWN** *for tire-bruising jobs*

**N**AME the jobs where stone bruises, cuts and snags are damaging your tires — and you've named the jobs for this rugged giant. For this is the Hard Rock Lug — the super-tough Goodyear with sidewalls armored by massive lug bars, with an extra-thick undertread protecting its extra-thick body, with a self-cleaning tread that means better traction forward or reverse. No wonder the Hard Rock Lug is top favorite with cost-wise operators for mining and pit and quarry work, and for all the toughest, roughest, tire-killing hauls!



## **HARD ROCK LUG**

Super-tough champ in all types of tire-killing work.



## **HARD ROCK RIB**

Companion tire for front wheels in all tire-killing service. Easier steering, smooth rolling, same card body, same shoulder and sidewall as the Hard Rock Lug.



## **ROAD LUG**

The high-stamina, dual-purpose tire that's best for trucks operating both OFF and ON the road. Tough construction and special tread design provide super traction off the road—long, smooth mileage on the road.

**THERE'S A COST-CUTTING  
GOODYEAR TIRE  
FOR EVERY JOB**

Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

# **GOOD YEAR**

**MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND**

Again Outstanding DESIGN for New Speed and Economy in Drilling

# Parmanco

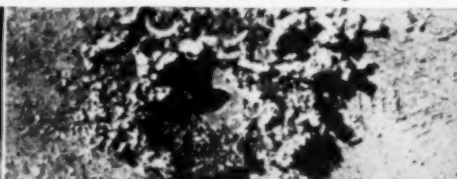
MODEL 51 • SELF-PROPELLED • HYDRAULIC  
COAL AND CLAY DRILL

This Model 51, one-man operated drill, adds another unit to the top performing PARMANCO line of drilling machines.

An example of its great value is seen in its ability to drill 2½-inch holes at a speed up to 7 feet per minute in No. 5 coal. It will also handle 4¼-inch augers up to 25 feet in depth.



• Hydraulic Feed • Finger-Tip Controlled • Fluid Motor for Auger Rotation

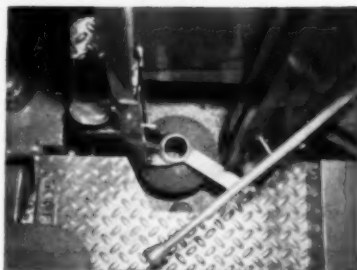


4 Jacks and Power Winch optional at extra cost.

Above

## New Automatic CUTTINGS SHIELD and GUIDE

Model 51 is equipped with the newly perfected Automatic Drill-Cuttings Shield and Guide. Now blast holes are kept absolutely clean from cuttings. Note in picture how a dam is formed about the blast hole, excluding casual surface water.



Looking down on New Automatic Drill-Cuttings Shield and Guide located at the right of driver's seat.

Send for  
Complete Details

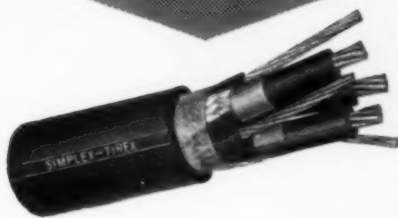
PARIS MANUFACTURING COMPANY • PARIS, ILLINOIS

**PERFORMANCE  
HERE**

**DEPENDS  
ON THIS**



Courtesy Bucyrus - Erie Co.



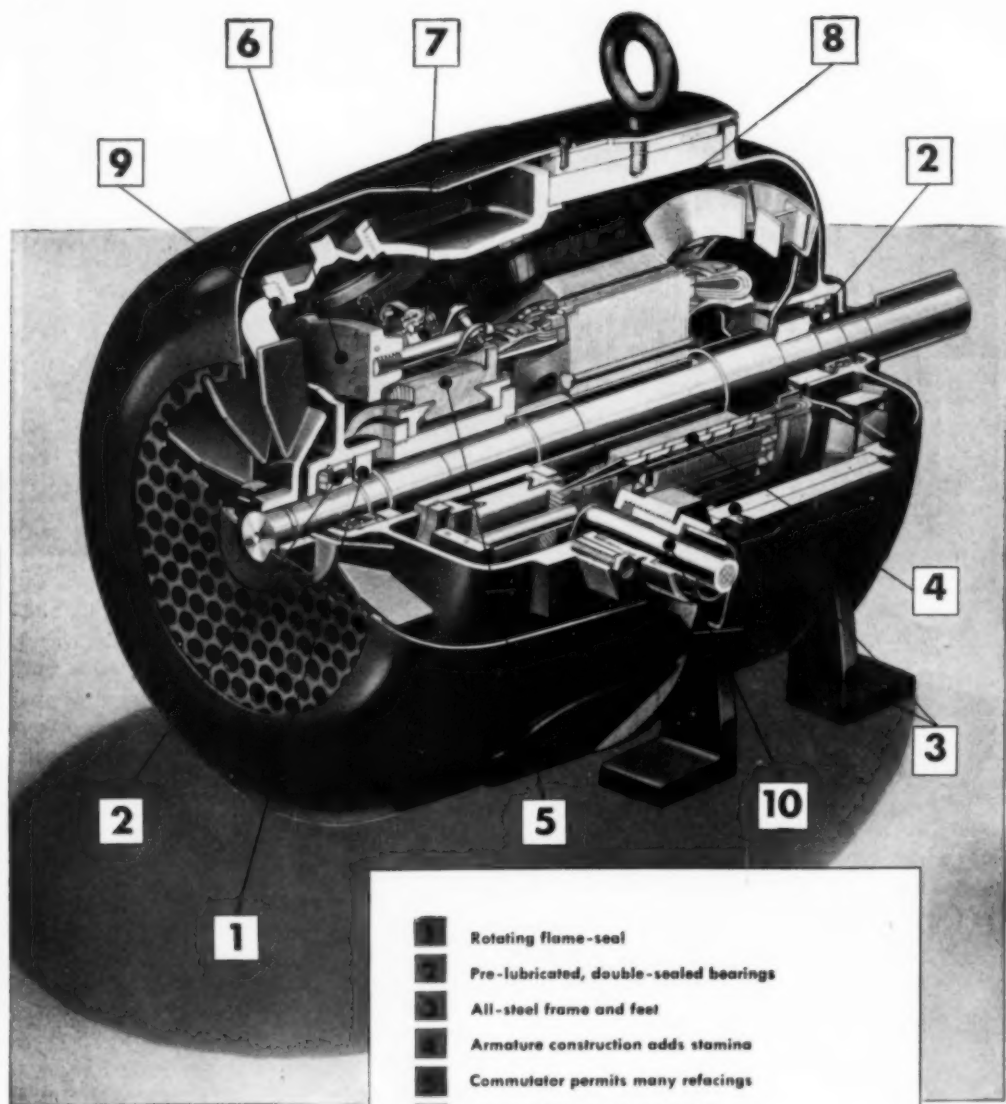
A measure of a shovel's efficiency is the size of its bite. But of equal importance is the length of time the shovel will keep on biting. That is why the trailing cable that transmits power to the shovel should be as good as you can buy. Compared with the cost of the shovel or other material-handling equipment, the cost of the trailing cable is insignificant. Yet a breakdown in this cable can have a disastrous effect on your cost. Nothing but the best is good enough.

TIREX Cables are first-quality cables. They are engineered for tough, long-lasting service. Service records covering many years prove that they give the service expected of them.

Whether the service is on a slusher hoist, a cutting machine, a continuous miner, or a stripping shovel, there is a size and type of TIREX Cable to fit every job. Whenever you need a portable cord or cable specify and be sure that you get Simplex-TIREX Cords or Cables. There are none better made.

# SIMPLEX TIREX

SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.



- 1** Rotating flame-seal
- 2** Pre-lubricated, double-sealed bearings
- 3** All-steel frame and feet
- 4** Armature construction adds stamina
- 5** Commutator permits many refacings
- 6** Arc-proof melamine rocker ring
- 7** Cast brass brushholders with stainless steel springs—noncorroding and individually removable
- 8** Field coil construction cuts repair costs
- 9** Flame-seals
- 10** Flameproof, dust-tight packing gland

# *Safer Mining* with this **Explosion-Proof SK Motor**

This Life-Line SK explosion-proof motor is built to the requirements of the U. S. Bureau of Mines for use on permissible equipment. An unyielding steel shell combined with special flame-seals—chokes off explosions internally—*before* sparks or flame can reach explosive mixtures in the mine. You just can't buy a *safer* motor for hazardous locations.

You get this safety, plus the same SK dependability proved in 40 years of mine operation. The heavy all-steel frame and feet provide a rigid foundation which cannot be shaken loose. Tufvar armature winding gives maximum electrical strength. Reinforced end brackets stand up to the shocking, jarring blows so often encountered in mine operation.

In addition, pre-lubricated, double-sealed

bearings give constant and positive lubrication without the trouble and cost of greasing attention . . . eliminate outages from dust in bearings. Cast brass brushholders may be removed individually through spacious front bracket openings. Here's a motor that can roll with the punch of daily knock-about mining operations.

Ask your Westinghouse representative to show you the Life-Line d-c Motor "Transvision" booklet B-4594. It will take you right inside the SK—show you the heart of real motor dependability. Remember, Westinghouse offers Life-Line explosion-proof a-c motors, too, in fact a motor for every need. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21035

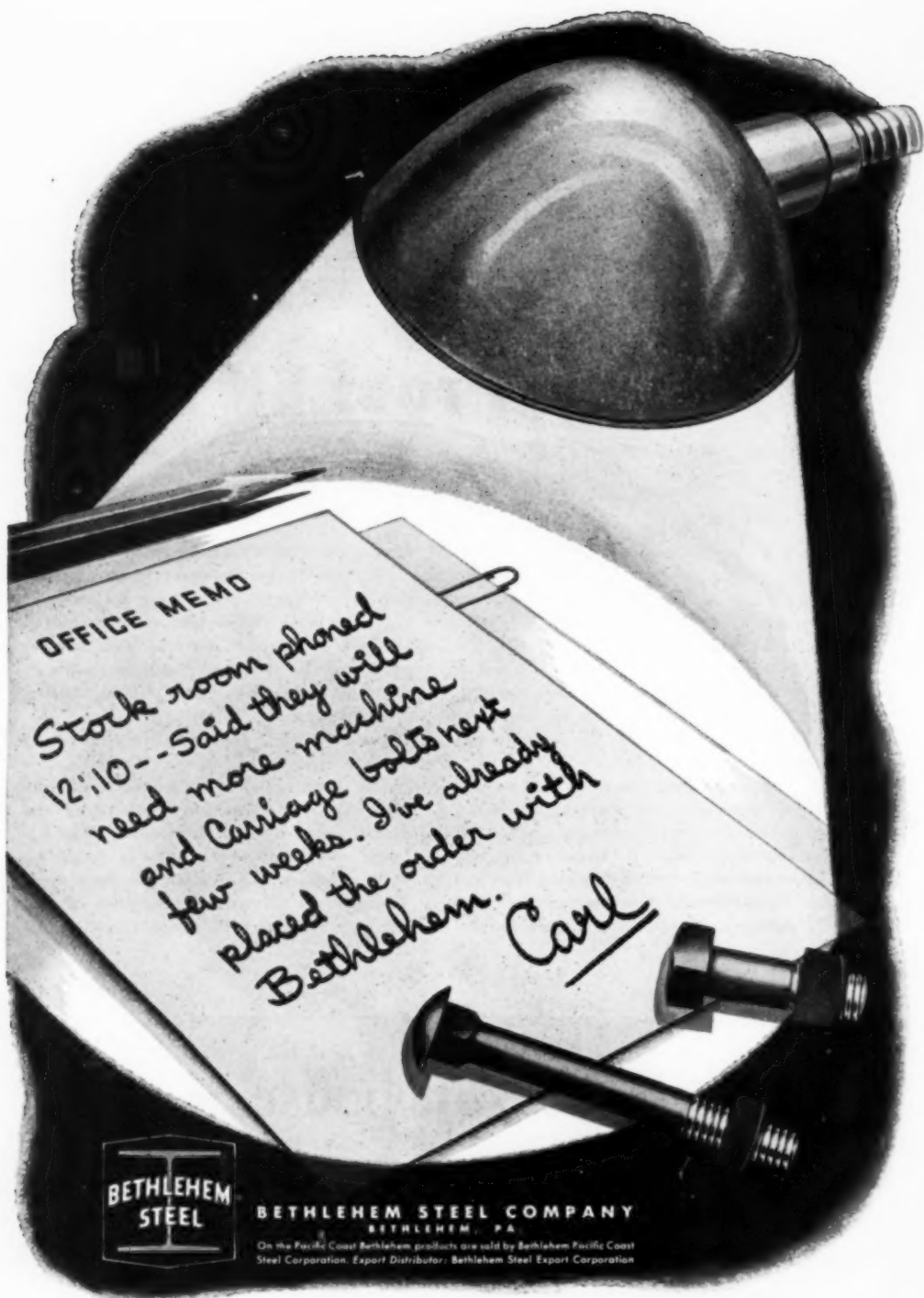
YOU CAN BE SURE... IF IT'S  
**Westinghouse**

*Life-Line*

**MOTORS and CONTROLS**







OFFICE MEMO

Stock room phoned  
12:10--Said they will  
need more machine  
and Carriage bolts next  
few weeks. I've already  
placed the order with  
Bethlehem.

Carl



BETHLEHEM STEEL COMPANY  
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



*Nothing on the Market Matches*



# JOY SULMET CUTTER BITS

## AGAIN SULMET BITS PROVE SUPERIOR

**THE PROBLEM:** A Western Pennsylvania mine has sulphur streaks, 1" to 6" thick, running throughout the seam. Hard clay veins occasionally obliterate the coal for two or three cuts. Both an undercut and shear cut were used, and shearing through these impurities caused so much wear that cutting time per shift was greatly reduced by frequent bit changing.

**THE SOLUTION:** A test run was made on their Universal machine with 125 Sulmet SMB Bits (see above). After four weeks of operation, three shifts a day, the test was considered complete, although 89 bits still had a life expectancy of two or three weeks. Even if all were considered worn out, bit cost would be only \$.026 per ton of coal. Also, cutting speed had increased tremendously since all bit-changing could be handled between shifts.

## WHEN IT COMES TO CONQUERING TOUGH SEAM CONDITIONS

JOY Sulmet Tungsten Carbide Cutter Bits can cut faster and at less cost per ton of coal than any other bit on the market—*facts proved by actual operating records from many different mining areas and under widely varying seam conditions.* An exclusive Joy feature—the use of a protective cap over the tungsten carbide insert—reduces bit breakage and practically ends insert loss. Sulmet Bits are available in eight cutter styles, including a design for the Bowditch ML Chain, plus auger and finger bits for Coal Drills.

● *Let us show you what they can do for you.*

See the Joy Film: "Sulmet Tungsten Carbide Bits" 16 mm • Sound • Full Color • 40 Minutes  
Write our Film Booking Office for free showing

*Consult a Joy Engineer*

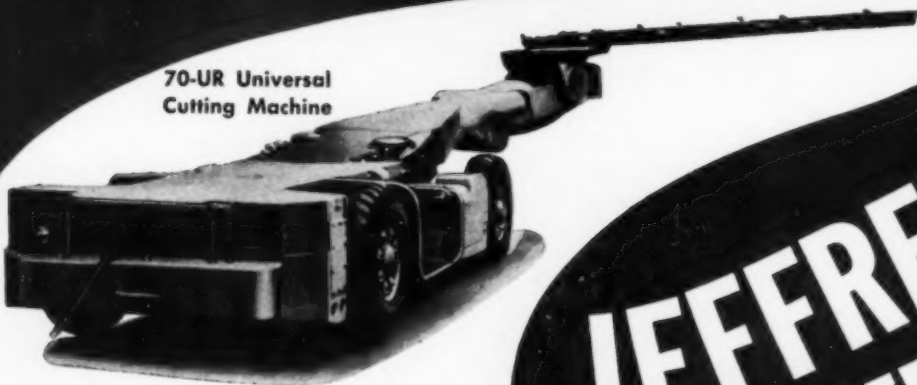


# JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

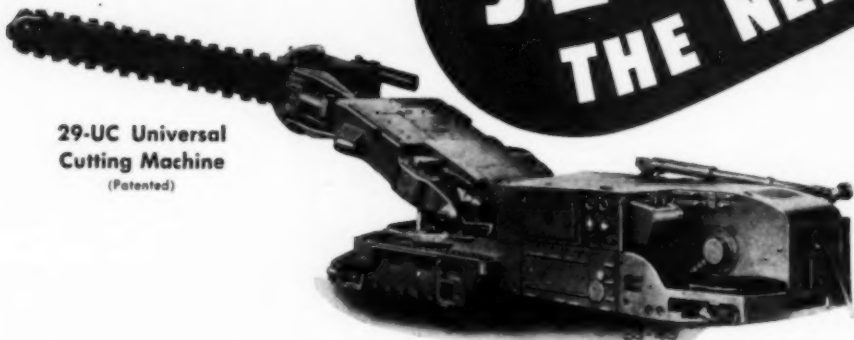
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

**70-UR Universal  
Cutting Machine**



**JEFFREY  
THE NEEDS**

**29-UC Universal  
Cutting Machine**  
(Patented)



**To meet** all the requirements of top, center and bottom cutting as well as shearing *in one machine* Jeffrey offers a complete line of Universal type coal cutters in three mountings: Rubber tired, Crawler, and Track.

These machines are designed for seam heights ranging from three and one-half feet to thirteen feet. They have completely rotating and adjustable cutter bars for making a cut any place in the seam from 11" below floor level to 13 feet above. They feature the latest developments in coal

cutting efficiency . . . are completely hydraulic in operation . . . are of compact, rugged construction. They will cut large quantities of coal with a minimum of maintenance.

The flexibility, maneuverability and ease of operation make these machines a highly profitable investment both from the standpoint of work accomplished and low cost of operation.

Catalog No. 835 pictures and describes more fully Jeffrey Universal and Arcwall Coal Cutters. Send for it.

**70-U Universal Cutting Machine**

(Patented)



# EQUIPMENT OF MODERN MEETS MINE OPERATION

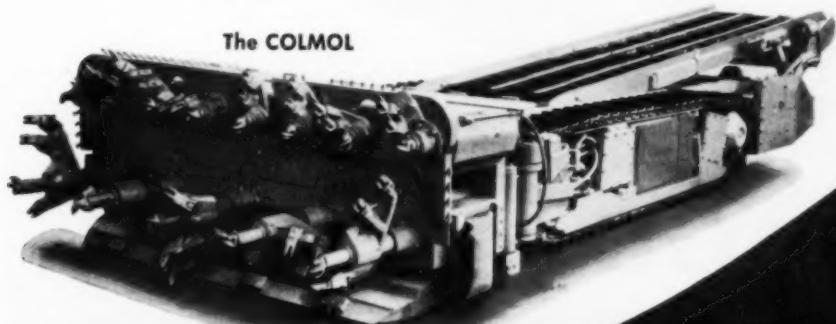


35-B Shortwall Cutter

Jeffrey 35 Series SHORTWALL Coal Cutters were designed to provide an easy-to-handle, powerful, rugged cutting machine capable of cutting coal at high speeds. Simplified operation . . . easy and speedy control from centralized position enables the operator to follow the cutting operation easily. Available in four types with either 35 or 50 HP motor depending upon conditions. They can be furnished with slack handling arrangement if desired. This device provides a cleaner kerf and makes for easy, fast removal of cuttings. Catalog No. 829 gives complete details.

The COLMOL is the latest contribution to mining and forecasts large output, great economy and safety. It introduces an entirely new principle of coal recovery whereby a series of slowly rotating arms with bits break the coal from the solid and sweep the coal loose to the center where it is picked up by a conveyor as the unit advances. Roof, walls and floors are left clean as machine mines and loads the coal in one operation without the use of explosives. The COLMOL is the answer to safe, low-cost continuous mining. Bulletin No. 834 for complete details.

The COLMOL



(Patent Pending)

# THE JEFFREY

MANUFACTURING COMPANY

Established 1877

912 North Fourth St., Columbus 16, Ohio

Baltimore 2	Boston 16	Cincinnati 2	Detroit 13	Houston 2	New York 7	St. Louis 1
Berkley, W. Va.	Buffalo 2	Cleveland 15	Ferry Port, Pa.	Jacksonville 2	Philadelphia 3	Salt Lake City 1
Birmingham 3	Chicago 1	Denver 2	Harlan, Ky.	Milwaukee 2	Pittsburgh 22	
Jeffrey Mfg. Co. Ltd., Montreal, Canada			The Galien Iron Works & Mfg. Co., Galien and Bucyrus, Ohio			
British Jeffrey-Diamond Ltd., Wakefield, England			Galien (Great Britain Ltd.), Wakefield, England			
Jeffrey-Galien (Pty.) Ltd., Johannesburg, S. A.			The Ohio Malleable Iron Co., Columbus, Ohio			
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio						





**DODGE**  
SOLID STEEL CONVEYOR PULLEYS



**So-o much Simpler!**

**DODGE**

→ of Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified telephone directory.



- The pulley for *modern* belt conveyors.
- Drum type construction provides maximum strength with minimum weight.
- Interchangeable hubs simplify installation, positioning, removal — insure better conveyors at *less* cost.
- Accurately formed. Uniform rim thickness. Fully enclosed — to exclude dust, dirt, water.
- Diameters 6 in. to 8 ft., all face widths. Popular sizes stocked by our distributors.

**DODGE MANUFACTURING CORPORATION**  
3000 Union Street, Mishawaka, Indiana

**FIRST**  
IN POWER TRANSMISSION  
MACHINERY!



V-BELTS AND TAPER-LOCK SHEAVES



TORQUE-ARM SPEED REDUCERS



DODGE-TINKER PILLOW BLOCKS



ROLLING GRIP AND DIAMOND D CLUTCHES



Kentucky Ridge Coal  
reports...

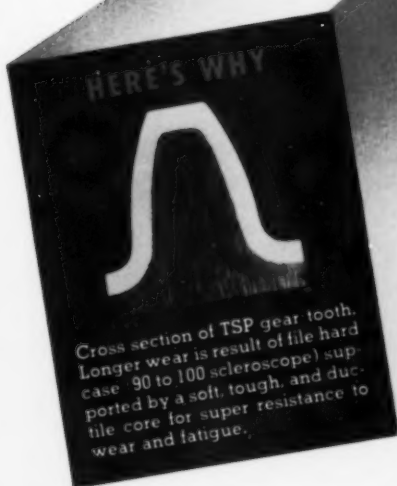
**17 YEARS**

**OF HARD WORK  
... AND PLENTY  
OF HARDNESS LEFT**

**IN THIS  
TSP\*  
AXLE GEAR**



TSP axle gear  
installed on Goodman  
93 Locomotive at  
Kentucky Ridge Coal Co.



Cross section of TSP gear tooth.  
Longer wear is result of file hard  
case 90 to 100 scleroscope) sup-  
ported by a soft, tough, and duc-  
tile core for super resistance to  
wear and fatigue.

### SERVICE RECORD

#### Competitive Gears

7 years service only. Gear  
badly worn—had to be re-  
placed

#### TSP Gears

17 years continuous service,  
still in operation, hardness  
only half worn

Dollar wise mine operators save with TSP parts in material,  
man hours, downtime. Write for Bulletin 948.

**\*TOOL STEEL PROCESS** PRODUCTS...  
the products that carry an absolutely positive **GUARANTEE** to give a  
longer life in the same service than any other product.

THE

**TOOL STEEL**

GEAR AND PINION CO.  
CINCINNATI 16, OHIO, U. S. A.

THE STANDARD OF QUALITY SINCE 1909 FOR GEARS • PINIONS • ROLLS • WHEELS AND OTHER HARDENED PRODUCTS

**BUCYRUS  
ERIE**

**6-YARD**

**150-B**

*Brings*

**NEW SPEED,  
POWER, CAPACITY**

*To Loading and Stripping*

**A**DDED to the time-proved superiorities of design and construction which have made Bucyrus-Erie quarry and mining shovels traditionally "years ahead" are important features new to an excavator of this size, yet *thoroughly proved in the field*. Among these 150-B features are:

*Exclusive Two-Section Boom* with tubular dipper handle free to rotate in saddle block. Used with outstanding success on Bucyrus-Erie's large stripping shovels for many years, this design speeds the working cycle and permits increasing the payload because it reduces front end weight materially — yet provides enormous strength. Upper boom section carries

only load resulting from pull of ropes, strong trussed lower section transmits directly to the revolving frame the vibrations, torsional and shock loads set up in digging. Rope crowd is quiet, positive, with crowd machinery located on the deck.

*Powerful New Main Machinery* designed for double twin hoist, smoothly delivers power where you want it, when you want it. Hoist machinery pulls dipper straight through tough banks with steady positive action. Fast smooth swing, with quick acceleration and deceleration, shaves seconds off every cycle.

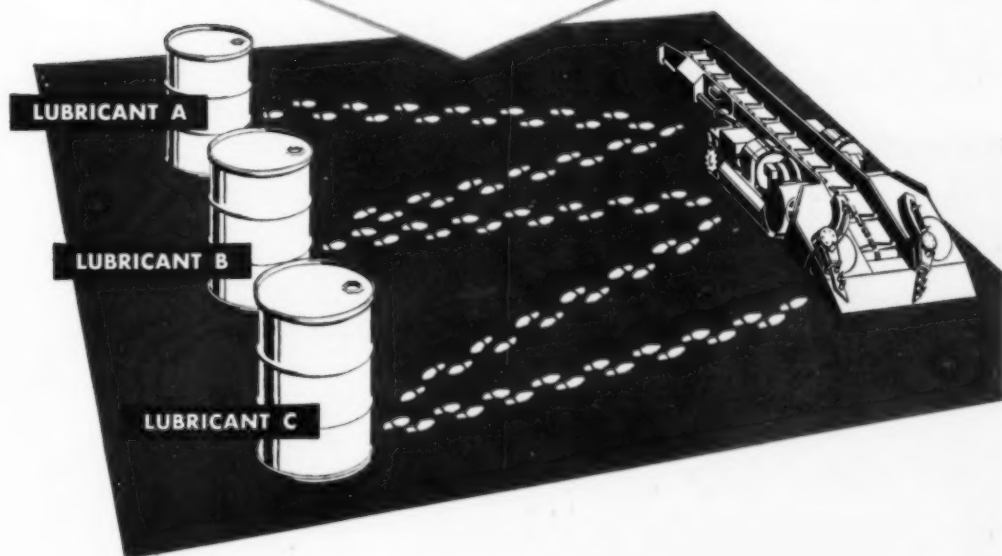
*Larger Stronger Mounting* has new propelling machinery arrangement, which provides rapid engagement of the propel for fast move ups. Cored box-section tread links have separate wearing paths for rollers and driving tumblers. Cat belts have high wear resistance, stay in adjustment for long periods.

The 150-B has full Ward Leonard independent motor control, is fully convertible to dragline service, features numerous other design advances that make it truly "years ahead".

2152



How much  
are these extra steps  
costing YOU?



**GULF MINING MACHINE LUBRICANT**  
**does the job of 2 or 3 other lubricants**  
*-and does it better*

Here's effective help in your efforts to reduce maintenance costs and simplify lubricant storage and handling—from oil house to face.

With Gulf Mining Machine Lubricant you eliminate confusion at

the face, prevent application mistakes, and insure better protection for lubricated parts.

For additional information on this top quality product, write, wire, or phone your nearest Gulf office.



**GULF OIL CORPORATION**  
**GULF REFINING COMPANY**  
Pittsburgh 30, Pa.

# We've Made Nothing But Coal Mining Equipment For The Past 80 Years

Use this specialized experience to obtain the most advanced design, the best of materials and the latest methods of manufacture. Take advantage of this background of creative engineering and long-standing reputation for sturdy construction that assured efficient, dependable performance at lower over-all costs. Call a Holmes Mine Equipment engineer for consultation in the planning and development of your requirements. There is no obligation.

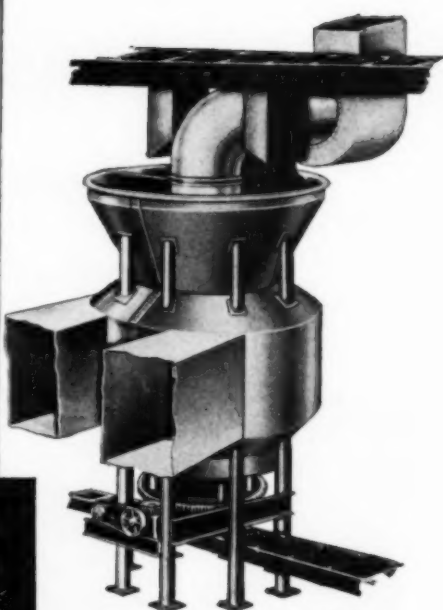
# HOLMES

## MINING EQUIPMENT

SINCE 1872



ROBERT HOLMES & BROS., INC.  
DANVILLE, ILLINOIS

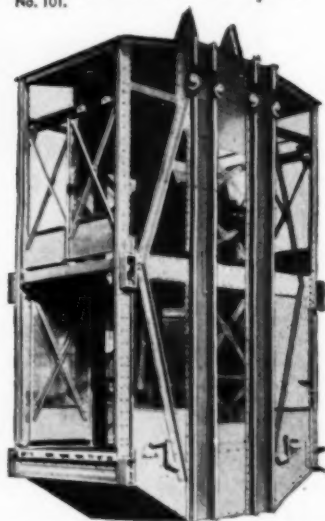


BAUGHMAN "VERTI-VANE" THERMAL COAL DRYER for economical, uniform large-scale drying of all sizes, from 1 1/4" down. Reduces surface moisture to approx. 2%. Unit handles 15 to 75 tph. Ask for Catalog No. 101.



ADVANCE DESIGN HOISTS feature the latest and most complete control equipment. Ask for complete information.

HOLMES HEAVY-DUTY CAGES in all sizes and types for rapid hoisting and low maintenance. Ask for complete information.



SHEAVES



TIPPLE  
EQUIPMENT



CAGES



SKIPS



LOWERING  
SPIRALS



CAR PULLERS  
AND RETARDERS



LABORATORY  
CRUSHERS



HOISTS



VIBRATING  
SCREENS



DUSTULATORS

# A New HEAVY DUTY BELT CONVEYOR

for Shuttle Car  
gathering  
in low coal

## THE Goodman TYPE 98

NEW  
NEW

extra strong intermediate sections of 8-foot length, "knockdown" design, permit easy handling where space is limited.

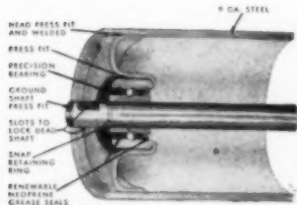
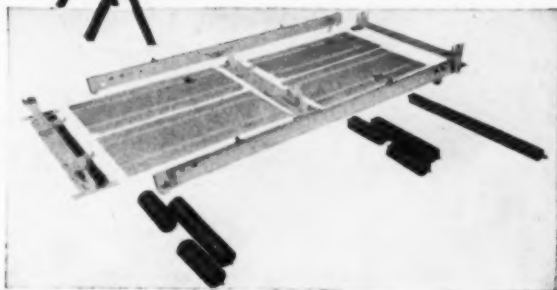
pre-lubricated, renewable seal, precision idler bearings for low maintenance and long attention-free service.

GOODMAN PATENTED LOCK-JOINT DESIGN STRONGER THAN HOOK AND BUTT FASTENING.

To show the unusual lateral strength and rigidity of the Type 98 belt construction, two assembled intermediate sections have been placed on edge and supported at each end. Even though the center joint is unsupported, there is no lateral movement. The deflection (only  $\frac{3}{8}$ ", see arrow) at this center point is due solely to the flexing of the side channels.



ONE MAN CAN HANDLE HEAVIEST PIECE. The heaviest piece in the intermediate section is the 8-foot side channel weighing only 47 lbs. Total weight of section is but 406 lbs. To disassemble a section, only four cap screws need be removed; others are merely loosened. Deck height of the assembled section is 7 $\frac{1}{2}$ ".



BEARINGS HAVE HIGH RATING AND GIVE ECONOMICAL SERVICE. The Type "A" Goodman pre-lubricated, renewable neoprene seal, precision idler bearing can be cleaned, relubricated, and resealed thus permitting attention-free operation and economical service. The advantages of this Goodman precision bearing are high shock resistance, heavy loads at high belt speeds, no greasing and ease of repair at mine.

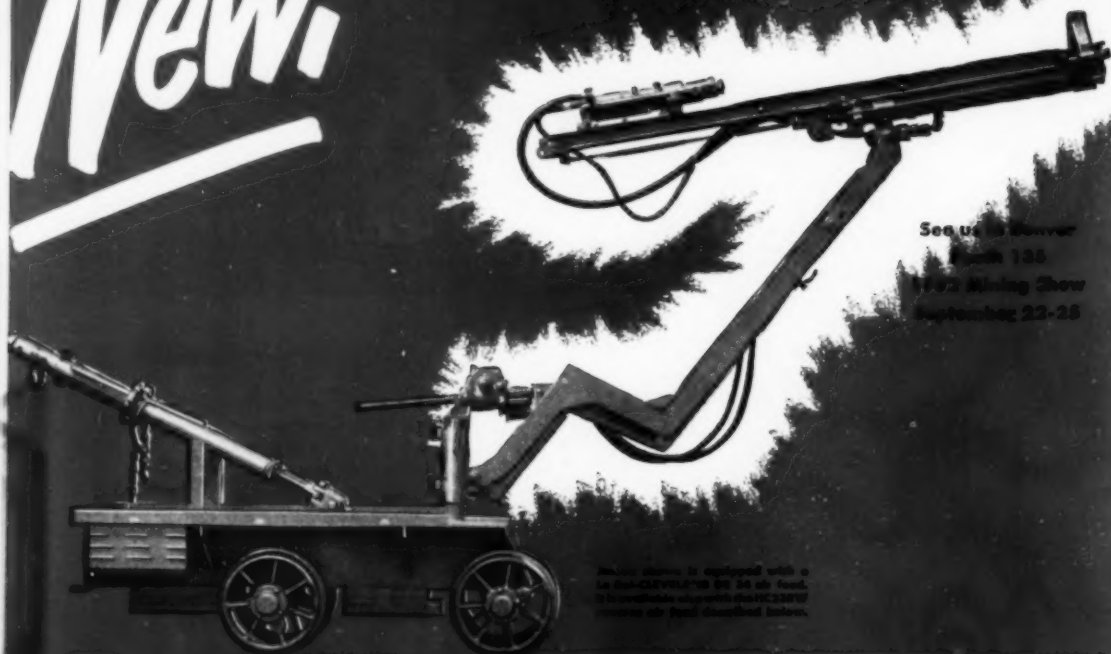
The Goodman Type 98 Belt Conveyor is available for 30" and 36" belt widths with idler rollers of 2 $\frac{1}{2}$ " to 5" diameter in either offset or in-line arrangement. Moreover, by the use of adaptor frames the type 98 intermediate sections can be used in the line with any underground belt conveyor (30" or 36"). Ask for Catalog CC-522.

**Goodman MANUFACTURING COMPANY**  
HALSTED STREET at 48th - CHICAGO 9, ILLINOIS



# New!

# Speeds up



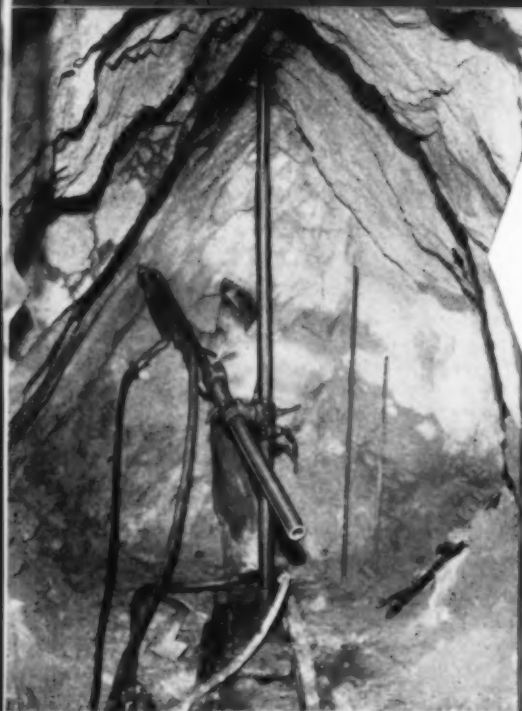
See us at Denver

Booth 135

1972 Mining Show

September 22-26

Machine shown is equipped with a  
Le Roi-CLEVELAND 30 50 air feed.  
It is available also with the HC23RW  
reverse air feed described below.



## Miners like Le Roi-CLEVELAND HC23RW Reverse Air Feed Drifters

### Management does, too

**Faster Steel Changes!** No swing or dump nuts to loosen and reset. Your miners simply swing drifter on feed cylinder and change steels. It's not only easy — it lets them drill out the round faster.

**No Stuck Steels!** Positive air feed keeps drills working at peak efficiency, avoids stuck steels.

**Higher Drilling Speeds!** Positive air feed plus proper force of blow and strong rotation give faster drilling speeds with both steel and tungsten carbide bits. You get longer bit life, too, and drill more footage.

**Low Upkeep Cost!** No feed screws or feed-screw nuts to wear. No complicated power-feed mechanism to give trouble.

**Easy to Operate!** Built to lighten the load on your miners. Feed controls conveniently located. Reverse air feed withdraws steel from hole quickly.

**Faster Set-ups!** The combination of Le Roi-CLEVELAND Air Feed Drifters and air columns gives you a unit that can be set up easily and quickly. And you can get the air column in any height you want.

# drilling cycles

## Le Roi-CLEVELAND *self-leveling* Mine Jumbo with four-foot steel-change Air Feed Drifter

**Saves time drilling lifters!  
Lets your miners drill the right  
round for any ground!**

You couldn't ask for more from a mine jumbo than the performance you get from this new Le Roi-CLEVELAND. It's got plenty of stuff. And the payoff for you is faster cycles, greater tonnage per man-shift, lower costs! Here's why:

**Self-leveling, air-motor-powered arm,** lets miners spot and space holes quickly and easily, for the most efficient fragmentation. They don't have to loosen a bolt or tilt a boom, to complete the drilling cycle.

**Exclusive rigid screw and gearing mechanism** keeps the heading straight, cuts down overbreak and underbreak. Keeps the drifters in line, prevents the steel from binding, reduces chuck wear.

**Offset arm** provides plenty of clearance to drill lifters — without having to take time out to swing the drill under the arm.

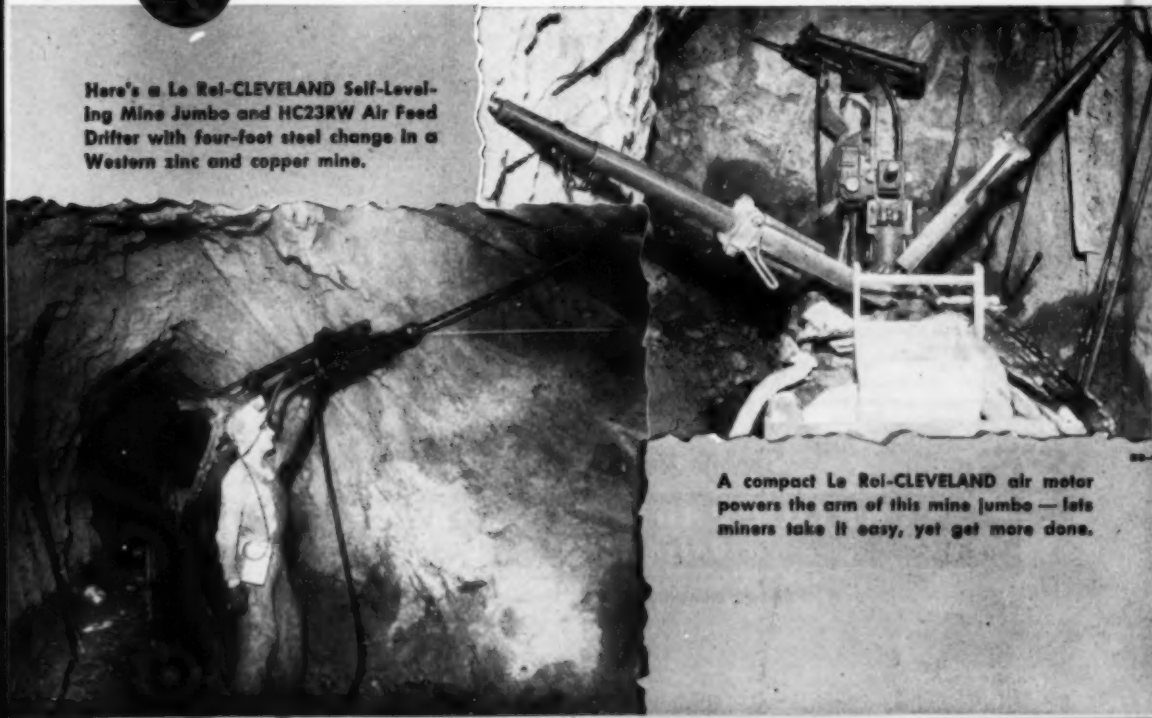
You can get this Le Roi-CLEVELAND Self-Leveling Mine Jumbo in either single-arm or double-arm construction. Write for further information and see for yourself how either model can help you get more done every shift.



### LE ROI COMPANY

CLEVELAND ROCK DRILL DIVISION  
12500 Berea Road, Cleveland 11, Ohio  
Plants: Milwaukee, Cleveland and Greenwich, Ct.

Here's a Le Roi-CLEVELAND Self-Leveling Mine Jumbo and HC23RW Air Feed Drifter with four-foot steel change in a Western zinc and copper mine.



A compact Le Roi-CLEVELAND air motor powers the arm of this mine jumbo — lets miners take it easy, yet get more done.



## "Carlon costs less!"

"Any way you figure it, CARLON costs less—less to install, less to use, less to maintain. What's more, you don't pay a premium price for these advantages—initial cost is about the same as that of ordinary pipe."

Here are the facts. CARLON costs less to install because it is lightweight (requires no rigging equipment), flexible (can be curved to follow irregular slope or entry direction), and is furnished in extremely long lengths (requires fewer fittings). It makes-up fast without special tools.

CARLON lasts longer than any pipe available at any price. It is guaranteed against rot, rust and electrolytic corrosion . . . withstands sulphurous waters, alkalis, metallic salts and other corrosive wastes . . . won't accumulate scale. CARLON has served over four years without maintenance under extremely severe mine conditions!

All CARLON pipe is factory-tested for more than eight hours at higher-than-working pressures.

NOM. SIZE	O.D.	I.D.	EST. BURST P.S.I.	WT. LBS. PER FT.	SHPG. LENGTHS
1/2"	0.840	0.622	540	0.103	400 ft. coils
3/4"	1.050	0.824	350	0.140	400 ft. coils
1"	1.310	1.070	200	0.181	300 ft. coils
1 1/4"	1.660	1.380	200	0.267	300 ft. coils
1 1/2"	1.900	1.610	200	0.320	250 ft. coils
2"	2.378	2.070	170	0.445	200 ft. coils
2 1/2"	2.875	2.449	170	0.680	200 ft. coils
3"	3.304	3.070	165	0.910	100 ft. coils
4"	4.504	4.030	150	1.250	25 ft. str.
6"	6.630	6.070	115	2.230	25 ft. str.

Identification Stripe: WHITE—Standard Pipe  
RED—Heavy-duty Pipe



100-CP

*Specify the Pipe with the Stripe!*

Write for Catalogs

**CARLON PRODUCTS CORPORATION**  
PIONEERS IN PLASTIC PIPE!

In Canada: MICRO PLASTICS, Ltd., Acton, Ontario

10300 MEECH AVENUE • CLEVELAND 5, OHIO



Up steep hills—on loose gravel and sand piles  
over sharp rocks—slush, mud, gravel—out and over  
the highway **GENERALS** deliver more loads

*Faster! Easier! At Lower Cost!*



**THE  
GENERAL  
L.C.M.**

**THE  
GENERAL  
H.C.T.**

**GENERAL L. C. M.**—for most work off-the-road. Massive tread and thick, tough shoulders develop extra traction. Extra wear on tough, jagged surfaces. Stronger rayon cord body with more natural rubber built into its shock-absorber design.

**GENERAL H. C. T.**—for more work on-the-road. Thick, saw-tooth tread supported by broad, angled shoulder cleats develop extra traction. Smoother rolling, quicker stopping. More original and more recap miles.

**Make Every Worn Tire Work Longer for More Profit!**

**Your GENERAL TIRE DEALER will KRAFT SYSTEM RECAP Worn Tires with the New GENERAL Truck Tire Tread of Your Choice**

You're throwing away money when you throw away worn tires or accept an ordinary "adjustment" for them. Let your General Tire Dealer—a tire expert—restore worn tires with famous factory controlled Kraft System Recap-

ping. You choose from the complete line of on and off-the-road new General Tire treads and he'll put that tread on your worn tire. He can do sectional repairs too. Get Kraft System Recapping—get more profit from every tire.



**SPECIFY GENERAL TIRES ON YOUR NEW EQUIPMENT**





# COMPTON AUGER

## *Improves product and cuts cost of* **STRIP MINE OPERATIONS**

The Compton Auger introduces an entirely new and unique method of recovering high wall coal at phenomenally low costs.

Used in conjunction with your present strip mining equipment you can blend auger mined coal with your regular production and improve the overall quality substantially.

In mines where these machines have been in operation for the past two or three years, the Auger has paid for itself many times. In fact, under normal production conditions it should pay off the investment in six months or less.

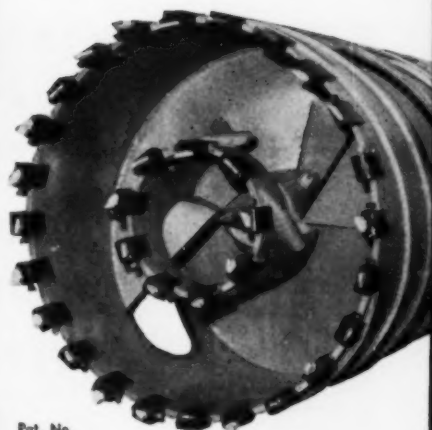
From the productive standpoint, the Model 42 shown here has been drilling 42 inch holes to a 189 foot depth and producing up to 500 tons per shift in the Pittsburgh seam. Another example—Nine Compton augers in use by five companies in three states have a total potential capacity of

1,800,000 tons per year based on 200 days of two shift work.

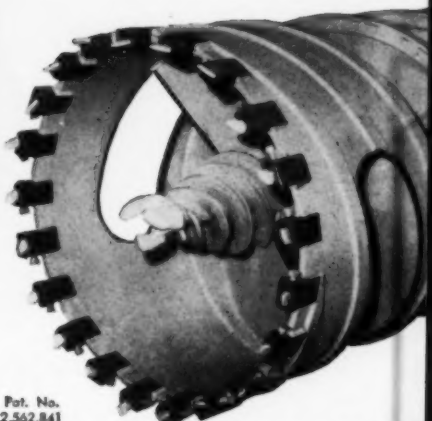
The Model 42 is 42 feet in length—weighs approximately 33 tons—carries nine 21 foot auger sections—requires only a 45 foot minimum pit width—is powered with 225 H.P. Diesel engine—has hydraulic jacks in each of the four vertical frame members which have a lift of 66 inches and permit drilling of overlapping holes—can be equipped with augers from 48 inch to 30 inch diameter.

The Compton Model 56 Auger is 56 feet in length—weighs approximately 50 tons—carries six 34 foot auger sections—requires a minimum pit width of 60 feet—also has a hydraulic lift of 66 inches and permits drilling of single or overlapping holes—is powered by a 300 H.P. Diesel engine—can be furnished with augers from 52 inch to 30 inch diameter—and provides a total drilling depth of 204 feet.





Pat. No.  
2,594,256



Pat. No.  
2,562,841

# MINING...

## COMPTON *Non-Clogging* AUGER HEADS

(PATENTED)

The unique cutting heads shown here were designed—developed and built by a coal operating company and their construction adheres closely to long accepted and proved practices of cutting coal. These new cutter heads have two types of core breakers which are interchangeable to meet the requirements of the various seam structures and to produce

more and larger lump coal.

The new type heads, capable of cutting coal at high speeds without clogging, assure a continuous flow of coal from head to truck during entire hole cutting operation. Maintaining a constant peripheral speed for all diameters makes it possible to get large tonnages even with the smaller diameter augers.

# COMPTON, Inc.

ORIGINATORS OF  
COMPTON LUMP  
RECOVERY HEAD

Box 1946—Phone 4-6384

CLARKSBURG, W. VA.



## — prevent it with **BWH ROTOCURED Belts!**

Belts made by the flat press method start with two, ten, twenty or more "strikes" on them—depending on the length of the belt. Weakened segments (inherent in the manufacturing process) result at 30- to 40-foot intervals because of press overlaps and hence, *overcuring*. The overlapping can't be avoided in flat press curing because each section when cured advances *less than a full press length*. Result: Premature failure of the weakened sections.

To eliminate these weak segments, BWH engineers pioneered **ROTOCURED CONVEYOR BELTS**. They're made by continuous, constant motion curing. This endless technique of curing by eliminating overlapping, eliminates the weak segments. *Every inch of the belt you buy is FIRST QUALITY!*

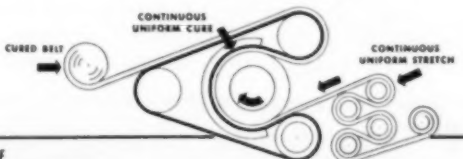
You'll see this quality in *Increased Belt Flex Life* (up to 40%)... *Elimination of Mechanical Distortion*

*at the Press Ends... Constant, Uniform Stretch... Uniform, Abrasion-Resistant Covers.*

If you have a tough conveying problem—put it up to your BWH distributor\* and BWH **ROTOCURED BELTS**. He has the "savvy" to solve it—the belt has the strength. Watch the cost per ton of material conveyed go down!

*\*Ask him also about BWH Transmission Belts. He'll show you how their operation at lower tensions assures longer belt life.*

### DIAGRAMMATIC SKETCH OF EXCLUSIVE ROTOCURE PROCESS



Another Quality Product of

**BOSTON WOVEN HOSE & RUBBER COMPANY**

Warehouse Stock: 111 N. Canal St., Chicago, Illinois

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U.S.A.

September, 1952 • COAL AGE



## That's All the Cleaning an Allis-Chalmers TEFC Motor Ever Needs

**M**AINTENANCE COSTS ARE LOW for users of Allis-Chalmers Totally-Enclosed, Fan-Cooled Motors. They are easy to clean because even the stickiest dirt can be wiped or blown off without dismantling the motor or even stopping it. They seldom require cleaning because cooling air flows over the outside of the motor. There are no external concealed air passages to clog up and cause over-heating. You get better operational continuity, lower maintenance.

### Bearings Save Maintenance, Too

Double-shielded ball bearings require no regular maintenance under most normal operating conditions. Yet if difficult service makes re-lubrication desirable, it can be done without dismantling the motor or bearings. Rigid cast iron frame and stiff end brackets maintain bearing alignment . . . assure maximum bearing life.

A-3639

Texrope and Vari-Pitch are Allis-Chalmers Trademarks.

# ALLIS-CHALMERS



### Get The Full Story Now

Your Allis-Chalmers Authorized Dealer or District Office can give you complete information on Allis-Chalmers Totally-Enclosed, Fan-Cooled Motors and how they can save you money. Call one of them today or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 51B7223.

### Sold . . . Applied . . . Serviced . . .

by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.



**CONTROL** — Manual, magnetic and combination starters; push button stations and components for complete control systems.

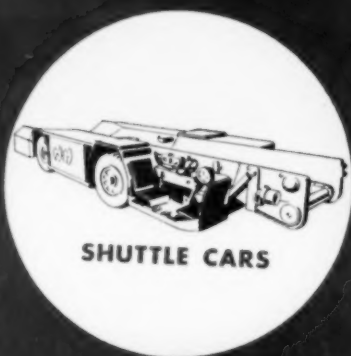
**TEXROPE** — Belts in all sizes and sections, standard and Vari-Pitch sheaves, speed changers.



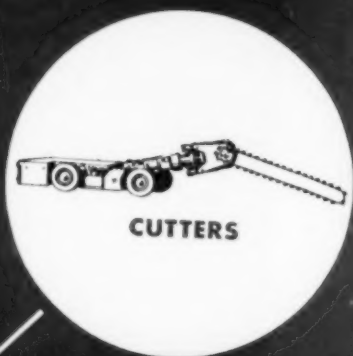
**PUMPS** — Integral motor and coupled types from 1/2 in. to 22 in. discharge and up.



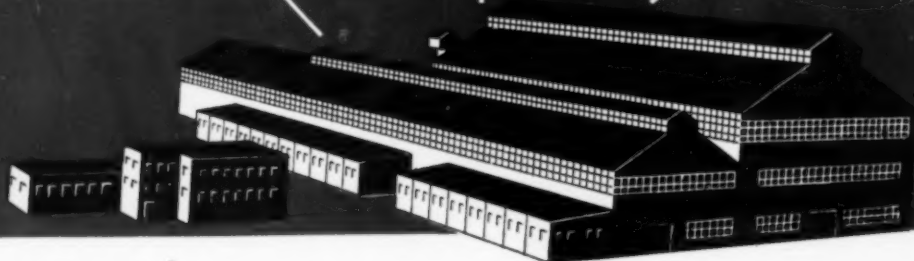
**LOADERS**



**SHUTTLE CARS**



**CUTTERS**



## ***Now! Faster—More Efficient Service*** **FOR REBUILDING YOUR JOY EQUIPMENT**

*The New Ashland Division*

( A S H L A N D , K E N T U C K Y )

*of*

**NATIONAL MINE SERVICE COMPANY**

The new Ashland Division of National Mine Service Company at Ashland, Kentucky, provides the largest, most modern production facilities devoted exclusively to the rebuilding of Joy equipment. This new plant is centrally located and accessible by truck or rail to all major coal fields east of the Mississippi.

The new Ashland Division—with a backlog of experience gained through years of rebuilding specialization, and extensive warehousing of genuine Joy replacement parts—means better rebuilding service than ever before offered the coal industry—*plus a definite schedule of delivery.*

*The New Ashland Division*  
HAS COMPLETE FACILITIES  
FOR REBUILDING



• SHUTTLE CARS • CUTTERS • LOADERS

Here's what the New Ashland Division offers you . . .

**1. Definitely Scheduled Delivery**

Down time of your equipment is greatly reduced—you know when job will be delivered.

**2. Cost Savings Through Advanced Methods**

Efficient plant, methods and tools mean lower rebuilding costs for you.

**3. You Need Not Carry Expensive Replacement Parts**

Ashland carries an extensive inventory of replacement parts for all Joy equipment—eliminating costly inventory expense for you.

**4. Genuine Joy Parts Used**

Your Joy equipment is quickly renewed to initial factory standards with genuine Joy parts.

**5. Superior Experience and Training**

A key group of highly skilled Joy rebuilding specialists form the production and training nucleus for the new Ashland Division.

**6. Changes to Your Specifications**

At Ashland, refinements or special features may be added to Joy equipment to give the advantages of a later model, or to better suit your requirements.

**7. Relieves Capital Expense on Your Part**

No need now to do your own rebuilding. Ashland Division facilities and the use of genuine Joy parts makes possible savings in your plant, overhead and personnel. Also, down time is cut to a minimum, and a rebuilding job equal to factory standard is assured.

**Write for the New Ashland Division bulletin—Today!**

*Now 7 plants  
to serve you!*

**National Mine  
Service Company**



ASHLAND DIVISION  
Ashland, Kentucky  
SEMCO DIVISION  
Beckley, W. Va.

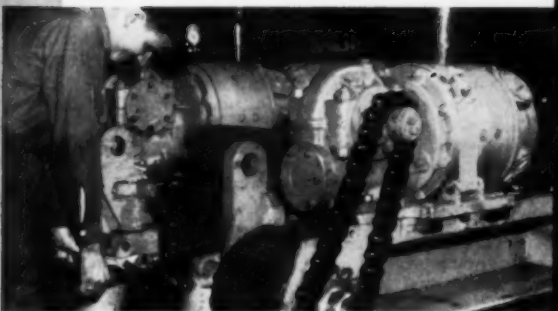
ALL-STATE DIVISION  
Logan, W. Va.  
KY.-VA. DIVISION  
Jenkins, Ky.

ANTHRACITE DIVISION, Forty Fort, Pa.

WHITEMAN DIVISION  
Indiana and Altoona, Pa.  
WESTERN KY. DIVISION  
Madisonville, Ky.



Re-wiring control panel



Installing new hydraulic system



Assembly area, showing four shuttle cars and a loader being rebuilt



# NOW... G-E Super Coronol<sup>®</sup> rated at 85 C copper temperature

NEW HIGHER RATING APPLIES TO ALL SIZES  
FOR 0- TO 8000-VOLT SERVICE

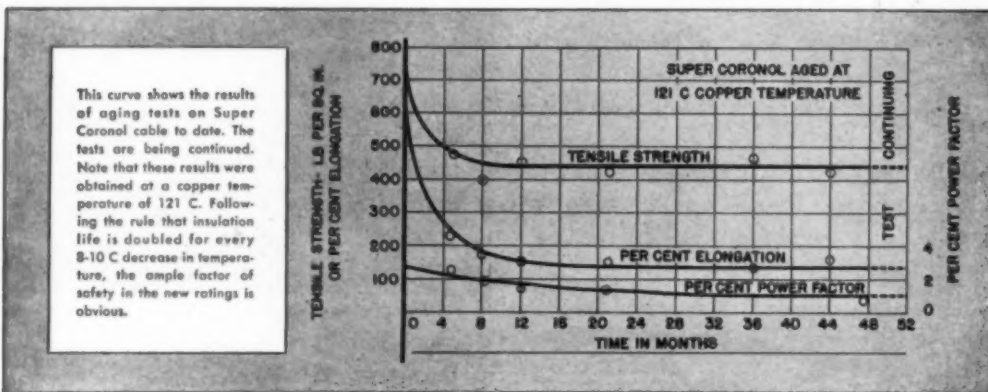
General Electric announces that effective immediately it is basing the ratings of all Super Coronol power cables for service up to and including 8000 volts on a permissible maximum copper temperature of 85 C. To our knowledge this is the highest rating ever announced for a solid dielectric power cable in this voltage range. For voltages above 8000, ratings continue to be based on 80 C.

The new temperature ratings mean that Super Coronol cables are now capable of carrying up to 12 per cent more power, continuously, than old-style ozone-resisting rubber-type compounds rated 75 C maximum.

This higher rating is a conservative increase, based on life tests of many cables taken from regular production. Most severe, and at the same time, most im-

pressive of these tests involves cable held continuously under load at a copper temperature of 121 C. This test is now nearing the end of its 5th year. Both physical and electrical properties have been stable since the 20th month. In view of such results, the new rating is still extremely conservative—and can safely be applied to all Super Coronol cable now in service at potentials up to 8000 volts.

G-E cable specialists in your area will be glad to help you calculate just what this new rating means in current-carrying capacity in any specific installation—both for continuous loading and for emergency overloads. Or you may wish to write Section W45-914, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.



<sup>®</sup>Registered Trade-mark General Electric Company

You can put your confidence in—  
**GENERAL  ELECTRIC**



Single conductor-  
Geoprene jacket



Single conductor  
shielded Geoprene



Pre-assembled  
aerial cable



Mine Power Cable



Two-conductor  
concentric lighting cable

**COALMASTER**  
*Augers...Drill Heads*  
*...Drill Bits*



No. 347 CoalMaster  
 Drill Head



No. 2875 CoalMaster Auger

## The Perfect Team for Strip-Mining Operations

### Spir-L-Weld Augers

- High-tensile alloy steel tubing Spir-L-Welded to core.
- Designed for maximum conveyance with minimum flight drag.
- Hexanspeed Coupling cuts changing time to seconds.

### CoalMaster Drill Heads

- Heat-treated cast steel, hard-surfaced for extra-long wear. Z-bar wedges hold bits securely in

a staggered position for faster cutting action and longer bit life.

- Equipped with Hexanspeed shanks for quicker assembly to auger.

### CoalMaster Bits

- Heat-treated special analysis alloy steel.
- Chisel or diamond point.
- Plain or hard surfaced.
- Replaceable.
- Low cost drilling.

### Order from your nearest Coalmaster distributor

• Austin Powder Co.  
 Cleveland, Ohio

• Dooley Brothers  
 Peoria, Ill.

• Illinois Powder Mfg. Co.  
 St. Louis; Salt Lake City

• Salem Tool Company  
 Salem, Ohio

• The Buda Co.  
 Harvey, Ill.

• Drillmaster Supply Co.  
 Evansville, Ind.

• Joy Manufacturing Co.  
 Main Office, Pittsburgh, Pa.  
 Representatives throughout the world

• Diamond Supply Co., Inc.

• Fairmont Supply Co.  
 Fairmont, W. Va.—  
 Washington, Pa.

• Mobile Drilling, Inc.  
 Indianapolis, Ind.

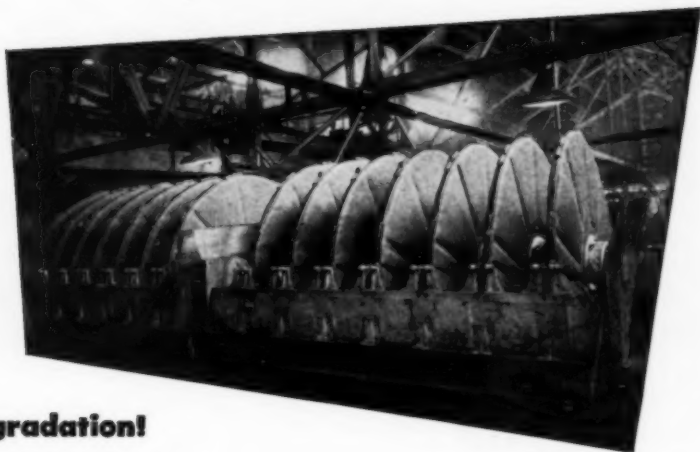
WRITE FOR NEW  
 COALMASTER  
 CATALOG



# CENTRAL MINE EQUIPMENT COMPANY

ST. LOUIS 15, MO.

# DEWATERING FINE COAL



**... without Degradation!**

**... with Clean Filtrate!**

**D**O IT the American way. A play on words? Yes, but nowhere can you find a more effective, higher capacity unit for dewatering fine coal than the American Continuous Filter.

Better yet, nowhere can you find a unit which, considering the stream pollution problem confronting coal companies, will do what a real dewaterer is supposed to do: separate solids from liquids without letting the solids through in damaging percentages. Filtrate from the American Filter handling fine coal ( $\frac{1}{8}$ " and under) carries on the average less than .1% solids.

And best of all — you will find that all this effective dewatering takes place without any degradation of product. The coal is handled gently.

Bring your fines dewatering problem to Oliver United. We have laboratory facilities and field test units for determining the best filter station. And we have several types of dewaterers to complement the American where sizes are such as to call for a different filter.

New York 18 — 33 W. 42nd St.  
Oakland 1 — 2900 Glascock St.

Export Sales Office — New York

Chicago 1 — 221 N. LaSalle St.  
San Francisco 11 — 260 Calif. St.

Cable — OLIUNIFILT

FACTORIES:  
Hazleton, Pa.  
Oakland, Calif.

## OLIVER UNITED FILTERS



### WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

#### CANADA

E. Long, Ltd.  
Orillia, Ontario

#### MEXICO & CENT. AMERICA

Oliver United Filters Inc.  
Oakland, Calif.

#### INDIA

Dorr-Oliver (India) Ltd., Bombay

#### EUROPE & NORTH AFRICA

Dorr-Oliver S. A. Brussels  
Dorr-Oliver S.N.a.R.L. Paris  
Dorr g.m.b.h. Wiesbaden (16)  
Dorr-Oliver Co., Ltd., London, S.W. 1  
Dorr-Oliver S.a.R.L. Milano  
Dorr-Oliver, N.V. Amsterdam-C

#### PHILIPPINE ISLANDS

E. J. Nell Co.  
Manila

#### HAWAIIAN ISLANDS

Honolulu  
A. R. Duvall

#### WEST INDIES

Wm. A. Powe — Havana

#### SOUTH AMERICA & ASIA

The Dorr Co.  
Stamford, Conn.

#### AUSTRALIA

Hobart Duff Pty., Ltd.  
Melbourne

#### SOUTH AFRICA

E. I. Bateman Pty., Ltd.  
Johannesburg, Transvaal



***in WIRE ROPE, too, longer life  
depends on the RIGHT KIND of muscle***

Massive, muscular structure gives the elephant the overpowering strength he needs to ward off the attacks of predatory enemies. Even in a hostile environment, these huge animals may stretch out their life span to well over a hundred years.

In wire rope, too, prolonged life is dependent on specialized muscles that will give best resistance to the

destructive forces encountered...whether they be abrasion, bending fatigue, load strain or shock stress. That is why in Wickwire Rope we make sure that you get the right grade of steel and size of wire...the right construction and lay of the rope...in short, the right kind of muscle for your particular job.

For full information contact our nearest sales office.



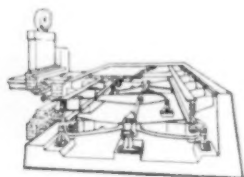
A YELLOW TRIANGLE  
ON THE REEL IDENTIFIES  
WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa  
THE CALIFORNIA WIRE CLOTH CORPORATION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane  
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New York • Philadelphia

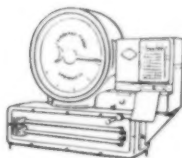
**WICKWIRE ROPE**



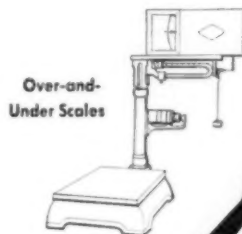
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION  
THE COLORADO FUEL AND IRON CORPORATION



Truck Scales



Printomatic Dial Scales



Over-and-Under Scales

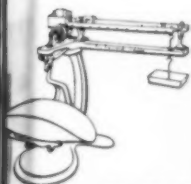


Type Registering Beam Scales

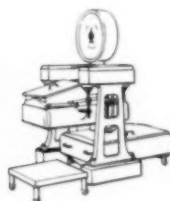
Bench Dial Scales



Portable Dial Scales



Counting Scales



Weigh Can Scales

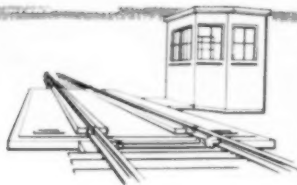
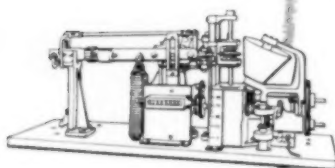


**FAIRBANKS-MORSE,**

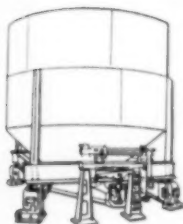
*a name worth remembering*

SCALES • DIESEL LOCOMOTIVES AND ENGINES  
• ELECTRICAL MACHINERY • PUMPS • HOME  
WATER SERVICE EQUIPMENT • RAIL CARS •  
FARM MACHINERY • MAGNETOS

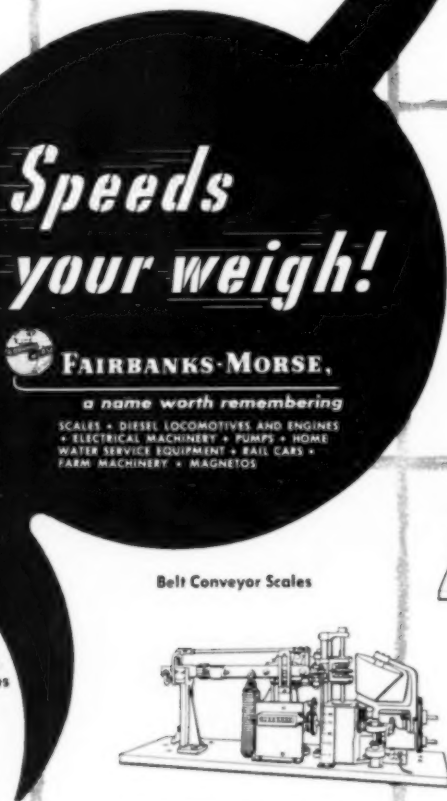
Belt Conveyor Scales



Railroad Track Scales



Hopper Scales



***Speeds  
your weigh!***

Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois



# How concave sides cut V-Belt costs

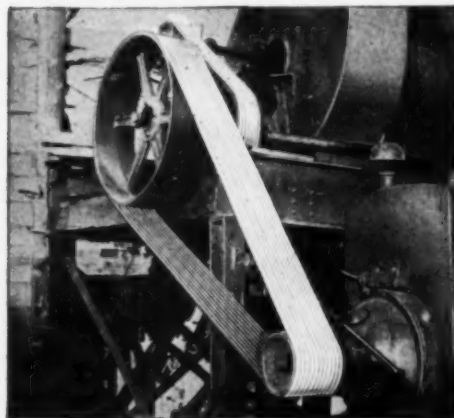
Important to anyone who wants to cut V-Belt replacement costs is the simple, interesting reason WHY Gates Vulco Ropes are built with *Concave Sides* (U. S. Patent 1813698). See Figure 1.



When a Gates belt is bent around a sheave these Concave Sides fill out to full, even contact with the sides of the sheave groove. (Figure 1A). This gives you sure pulling power. And, naturally, because wear is distributed evenly, the Concave Sides actually give you longer wear—longer belt life. That cuts V-Belt replacement costs.



On the other hand, when a straight sided V-Belt (Figure 2) is bent, the sides bulge out, preventing the belt from fitting evenly in the sheave groove. This causes *extra wear* at the points shown by arrows. (Figure 2A).



## Make this simple test yourself...



Hold a straight sided V-Belt as it would be bent around a sheave. Take the sides of the belt between your finger and thumb. You can *feel* the bulges in the sides—the bulges that prevent an even fit in the sheave groove and cause extra wear.

Now do the same thing with a Gates Vulco Rope. You can feel the sides fill out. You can see why they press firmly and evenly against the sides of the sheave groove—giving you longer belt life—lower belt costs.

When you buy V-Belts be sure to get Gates Vulco Ropes—the V-Belts with the Concave Sides.

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and in 71 foreign countries.

## SAVING \$600 ANNUALLY

When these sand drying drums were flat belt driven, heat and dust reduced belt life to as little as two weeks.

The Gates Vulco Rope drives that replaced them are saving the Zigler-Cline Construction Co., Fayetteville, North Carolina, more than \$600 annually.



VULCO  
ROPE

DRIVES

THE GATES RUBBER COMPANY • DENVER, U.S.A.

V-Belts — Hose  
Molded Rubber Goods  
for Industry  
World's Largest Maker  
of V-Belts

# Why is this the best buy in power conversion equipment?

When Westinghouse delivered this portable Ignitron Rectifier Substation it came complete . . . mounted in three mine cars. There was nothing else to engineer or buy. All the mine did was hook up the end car to the a-c line and take off the d-c at the other end.

## **Unit gives uninterrupted production**

Westinghouse Ignitron units have an unequaled service record in the mining industry. Since 1937 they've racked up a total of 15,000 years of accumulated service. One Western mine reports: "Our experience with a Westinghouse Ignitron Rectifier Substation has been highly satisfactory. The installation is unattended. It cuts out on shorts then cuts back in again. An electrician visits it every two weeks to clean and inspect contact points. There has been no other maintenance cost. We have never had to renew a tube during a million and a half tons of production."

## **Fast Westinghouse service in all locations**

But if they ever should need service, Westinghouse can provide it—FAST. We have repair plants near all mining districts. Renewal tubes and parts are carried in 24 warehouses throughout the country. Highly skilled field engineers are on call at 37 locations. You're *always* near skilled Westinghouse service.

## **Call Westinghouse early on every job**

The Ignitron Rectifier Substation is an outstanding example of Westinghouse developments for the mining industry. We make a *complete* line of electrical equipment for mining service. Next time you need electrical equipment, call your nearby Westinghouse office. Westinghouse Electric Corp., Box 868, Pittsburgh 30, Penna.

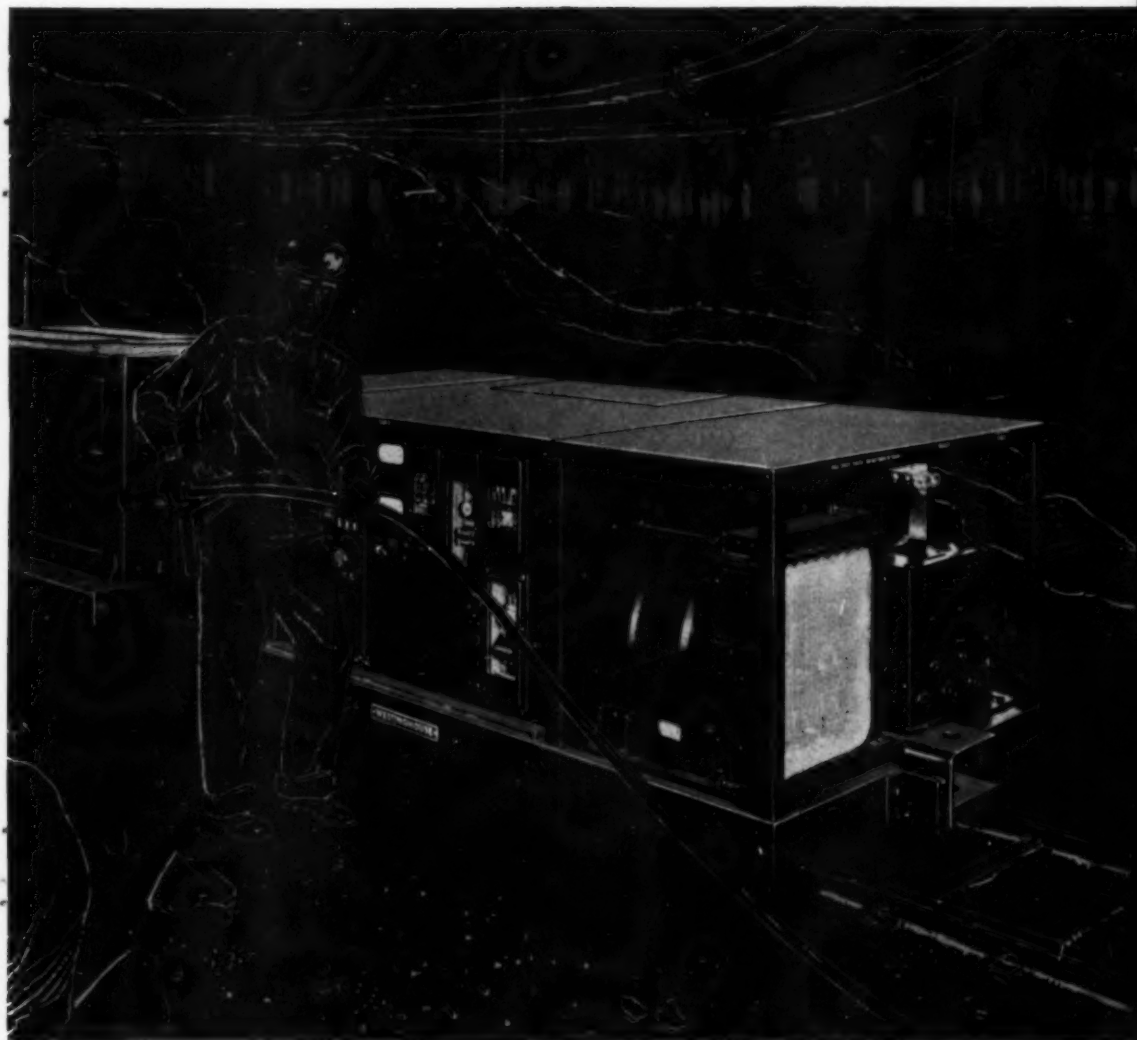
J-94924



YOU CAN BE SURE...IF IT'S  
**Westinghouse**

**EQUIPMENT FOR  
MINING**

**They did what you can do  
to produce more**



The Westinghouse Ignitron Rectifier Substation is available as a portable unit like that shown above, or in compact stationary cabinets for permanent installations.



cut down on  
drying expenses... with a  
**LOUISVILLE DRYER**  
by  
**General American**



Louisville Rotary Cooler with rotary shell and external water sprays.



Louisville Rotary Steam-Tube Dryer—indirect type using steam as heating medium, and utilizing 85% of that steam for useful work.

There is a **LOUISVILLE DRYER** for better drying in the following industries: Brewing • Canners By-Products Chemical • Distilling • Fertilizer • Fisheries • Feeds • Foods Mining • Packing House Products • Wood Products

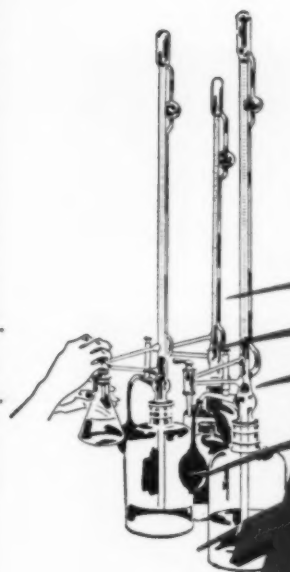


LOUISVILLE DRYING MACHINERY UNIT  
**GENERAL AMERICAN TRANSPORTATION CORPORATION**  
General Offices: 135 South LaSalle Street, Chicago 90, Illinois  
Dryer Sales Office: 139 S. Fourth Street, Louisville 2, Kentucky  
OFFICES IN ALL PRINCIPAL CITIES

## Know the results before you buy!

A Louisville engineer can tell you every saving, every improvement, every bit of increased efficiency *before* you invest. A Louisville Dryer is fitted to your job. It's the result of a Louisville engineer's complete analysis of your particular problem, of *knowing* your problem thoroughly... and solving it by applying 50 years of drying experience, and using the testing facilities of General American's laboratories.

More than once, a Louisville Dryer has turned a losing operation into a profitable one. Write or call for a Louisville engineer to make an obligation-free survey of your operation.



*custom blended*  
**to your specifications**

# Ashland

*special*  
**DIESEL**

Ashland's complete refinery control methods permit us to offer a great variety of diesel fuels, blended to meet your specific needs. Our eight refineries utilize many different grades of crude, each of which has different characteristics. Through careful selection and blending of stocks, we can accurately control volatility, stability, fluidity and provide just the performance you may need.

Ashland and Valvoline  
offer a complete line of  
quality lubricants, each



**fuels and lubricants**

made for the specific job. Available lubricants include those made from pure Pennsylvania crude, also conventionally and solvent refined mid-continent stocks.

Get in touch with us and we will be glad to have our nearest representative provide you with test samples of our fuels and lubricants from which you can choose exactly what you want.

*... complete line of lubricants for diesel equipment*

**ASHLAND OIL & REFINING COMPANY**  
ASHLAND, KENTUCKY

SUPPLY TERMINALS: Ashland, Ky. — Buffalo, N. Y. — Canton, O. — Cincinnati, O. — Cleveland, O. — Erie, Pa. — Evansville, Ind. — Findlay, O. — Gallatin, W. Va. — Freedom, Pa. — Kenova, W. Va. — Kokomo, Pa. — Louisville, Ky. — Marietta, O. — Nashville, Tenn. — Niles, O. — Paducah, Ky. — Pittsburgh, Pa. — St. Elmo, Ill. — St. Louis, Mo. — Toledo, O.



# get all the coal out of

## AIRDOX CARDOX

NON-EXPLOSIVE MINING METHODS

### Give You Higher Coal Production at Less Cost

The first place to increase your mine profits is right at the working face.

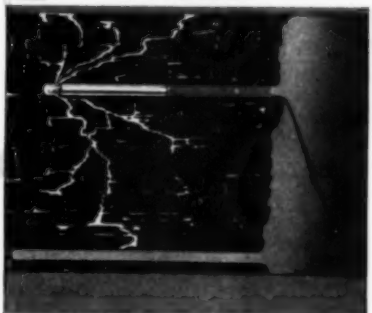
And it's here that Airdox or Cardox can help you get out more coal—faster—and in easier-to-handle form than is possible by other methods. Using the powerful, but smooth, acting force of compressed air or expanding carbon dioxide, they "heave" coal out and roll it forward in loose piles for easy mechanical loading. There's no shattering blast to smash much of the coal into undesirable fines or to raise excessive dust that can cause fires or explosions. Mine roofs aren't shatter-cracked; extra timbering needs are reduced.

With Airdox or Cardox, men and equipment can go to work immediately after coal has been dislodged. Because less fines are produced, the coal is easier to clean and process. Degradation is also minimized.

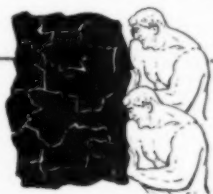
Over a period of years—and in more mines every year—Airdox and Cardox have proven their value. Both are adaptable to almost any mine with practically no change in operation necessary.



A lot of coal profit is often blown to bits—but not with Airdox or Cardox.



Airdox and Cardox dislodge coal gently without producing excessive fines, degradation or damaging the mine roof.



#### Which Method for You?

Both Airdox and Cardox offer impressive advantages and economies. Which is best for you can be determined after our engineers have studied your mining operation. There's no obligation—ask that one of our men call on you soon.

# your mine profitably

Where thin seams or poor roof conditions make mining by regular methods unprofitable or unsafe, this simple, low cost AugerMiner earns bonus money for you. It takes over where regular methods stop. With little or no added development expense, you can drill out tonnage that otherwise would be lost. The coal produced is cheaper to process because the AugerMiner drills out coal free of impurities from roof or bottom.

The AugerMiner teams with a mechanized conveyor for the ultimate in fast, efficient loading. The AugerMiner can "reach" as far as 100' into a seam for extra coal. Powered by a 25 HP electric motor, it can handle augers to 28" in diameter.

Operators work in safe, easily timbered areas. Coal between holes in the seams provide ample support

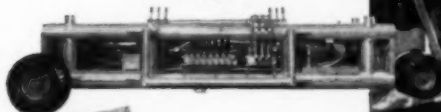
for roof in drilling areas. All controls are centralized for speedy operation by minimum crew.

## CARDOX-HARDSOCC *Underground* **AUGERMINER**

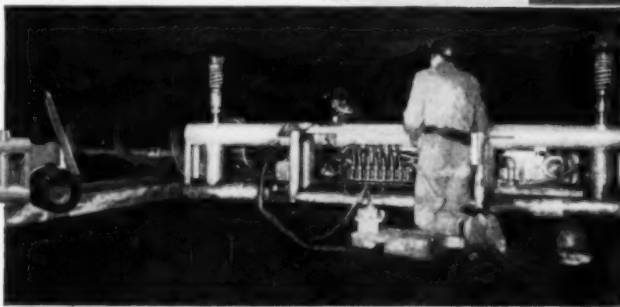
*Taps Profits  
in Thin Seams*



Removable tramming gear and low overall height makes the AugerMiner easy to move and position.



AugerMiner is fully described in new bulletin. Write for your copy today.



Hydraulic roof and floor jacks lock AugerMiner in place and keep the auger positioned or aligned for directional control.

**CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS**  
MINING DIVISION • Boston, Illinois • Camden-on-Deer, W. Va. • Evansville, Indiana • Harpers, W. Va.  
Office: • Albany, Pa. • Knoxville, Tennessee • Summit Creek, Kentucky • St. Louis, Mo.

# Whaley "Automat" Now Available with Crawler Mounting for Off Track Loading

Shovel Action Loader  
Now Built Either  
Track Mounted or  
Crawler Mounted

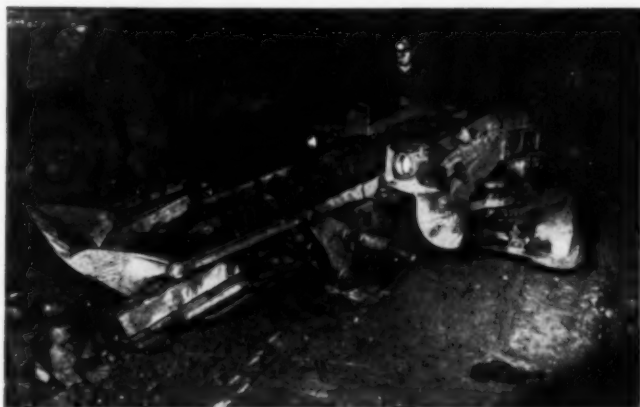
The shovel action Whaley "Automat" loading machine is now available for off track loading as well as track loading.

Myers-Whaley Co., Knoxville, Tenn., builders of the first successful underground loading machine, are now building the Whaley "Automat" on crawler mount for operation in mines where off track loading is most desirable.

The Whaley "Automat" Crawler Unit is a completely independent structure upon which the "Automat" loading machine is mounted. The loading machine above the crawler mounting is the same Whaley "Automat", either the No. 3 or the No. 3-LS, as the track mounted machine, but omitting the axles and track wheels, and with the main frame of the loading machine set down on and supported by the crawler frame.

All the advantages of the track machine are obtained in the crawler mounted "Automat", plus a very simple and efficient crawler mechanism.

The Crawler Mounted "Automat" has all the exclusive advantages of the track machine. 1—The exclusive, natural, automatic shovel action. 2—Safe loading with no sudden side kicking of rear conveyor. 3—The parallel lift rear conveyor which takes full advantage of limit-



THE CRAWLER MOUNTED Whaley "Automat" is shown here in operation under the strenuous loading conditions of iron ore. Note the clean floor left by the machine.

ed head room. 4—A rated 7 ton per minute loading capacity with only one motor and it only 25 HP.

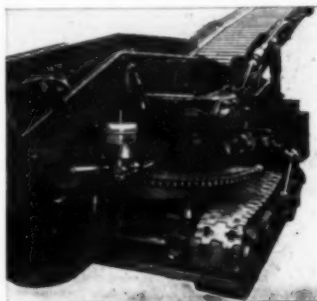
Basic mechanical features include: Two speed tramming. Power driven spooling reel for the trailing cable, and automatic lubrication.

The hydraulic control system for the crawler unit is separate from the main hydraulic system of the loading machine. Three additional valves in one bank are used for the crawler control.

An important advantage of the Whaley "Automat" on Crawler Mounting is that the use of the steering is greatly reduced as the machine will carry up to a width of 24 feet from just one setting of the crawlers. This means that the machine is easy on the bottom.

The loading capacity of the Crawler Mounted "Automat" is 280 cu. ft. per minute. It averages 120 cu. ft. per minute.

Complete information on the Whaley "Automat", track mounted and crawler mounted, coal and



CLOSE UP is shown here of the crawler mount with guards removed on left side.

rock loaders may be obtained by writing Myers-Whaley Company.

Folder No. 472 gives details and specifications on the Whaley "Automat" track mounted loaders. Folder No. 2015 gives the details and specifications on the Whaley "Automat" crawler mounted loaders.

**MYERS-WHALEY**  
KNOXVILLE, TENN.



HERE IS THE CRAWLER MOUNTED Whaley "Automat" in normal loading position. Note the adequate protection guards over crawlers. This is a right hand controlled machine. Left or right controls are optional, either on the Jib or Main Frame.

Proved by users from coast to coast...

# MACWHYTE WIRE ROPE

**A THOUSAND AND ONE**  
different ropes  
Designed right—made right  
PREformed and  
internally lubricated



**MACWHYTE  
COMPANY**  
KENOSHA, WIS.

EVERY REEL of Macwhyte Wire Rope reflects a pooling of users' experience. Over the years this experience has been studied in the field by Macwhyte engineers. Your requirements dictate the design and making of Macwhyte Wire Rope for all equipment.

Recommendations for your particular needs are promptly available either from Macwhyte Distributors or Macwhyte Company.

**ASK FOR CATALOG G-15**

MACWHYTE COMPANY, 2940 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

**BLASTING CLUES**  
from the  
**ATLAS**  
**MACHINE-GUN**  
**CAMERA**



## Watch the perfect control

The A. E. Dick Contracting Co. got excellent confinement with the ROCKMASTER Blasting System in this stripping operation for the Hudson Coal Co. near Wilkes-Barre, Pennsylvania. There was no noisy air blast from wasted explosive gases . . . no flying rock to damage nearby equipment. There were 16 holes with 15 x 15 ft. spacing. Average depth of hole was 32 ft. and the burden was medium sandstone. ROCKMASTER electric blasting caps Nos. 1 to 6 were used in an alternate pattern.



1. 4000 lb. of dynamite ready to shoot.  
Note expensive equipment nearby.



4. Height of blast. All heave completely controlled. Minimum vibration.



5. Burden falls as first dust and smoke appear. Perfect blast control.

See how ROCKMASTER can be put to work for you. Send for your reprint of the technical paper "Overburden Blasting Techniques" describing loading patterns for all principal types of overburden blasting.

**ROCKMASTER GIVES MOST EFFICIENT USE OF FORCE, CONTROLLED THROW, MAXIMUM BREAKAGE.**



# in this ROCKMASTER® blast



2.  $\frac{1}{3}$  second after detonation shows excellent confinement of blast.



3. Burden still receiving full power of explosives—no escaping gases.



6. Spent gases finally make a quiet exit. Burden completely shaken.



7. Height of final pile shows excellent displacement for easy digging.

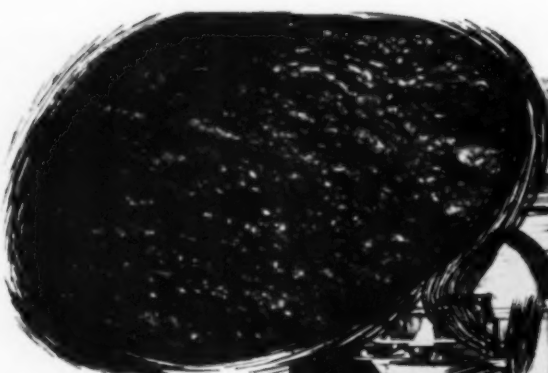
ROCKMASTER REDUCES ALL  
THE NOISE, VIBRATION AND  
FLYING ROCK TO A MINIMUM.

## ATLAS EXPLOSIVES

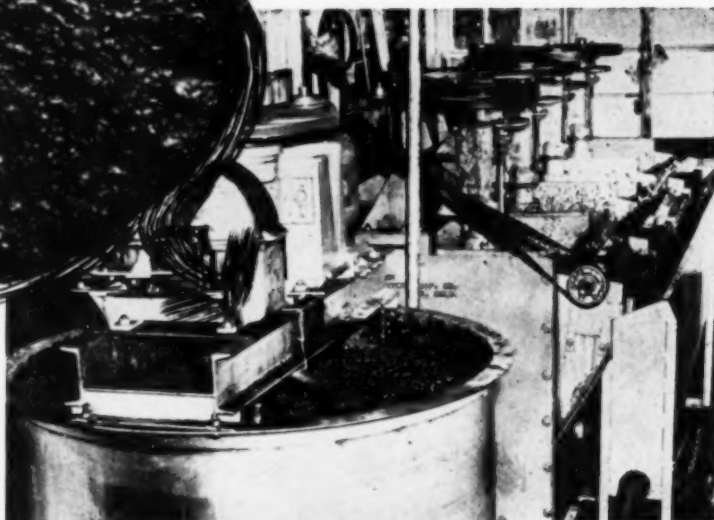


"Everything for Blasting"

ATLAS POWDER COMPANY • WILMINGTON 99, DELAWARE  
Offices in principal cities



**Convert  
Fines to Profits  
the Deco way!**

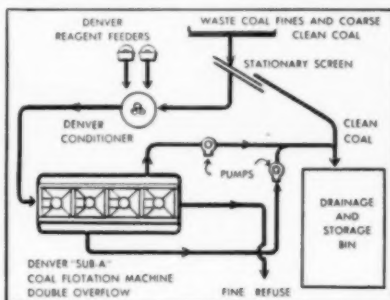


# **NOW...Small Coal Plant Washeries Can Cash In On Reclaiming Fines...with Denver "Sub-A" Flotation!**

Denver "Sub-A" Flotation gives operators of small washeries a low-cost method to recover fines at extra profits. You can recover a low-ash, clean coal product (-20 mesh to 0 mesh) that would otherwise be wasted. Recovery of fines can be the difference between breaking even and profit.

Coal fines, increased with mechanized mining, can now be recovered and cleaned with flotation. You reduce stream contamination, and you get a marketable product because of low-ash and sulphur content. Marketing is easy! Many washery operators simply add fines to their regular market product.

Why not cash in on extra recovery and make more profits with Denver "Sub-A" Flotation. Eliminate washery waste. Denver Equipment Company is the world's largest manufacturers of Flotation Machines. Let Denver Equipment Company engineers suggest an economical flotation layout for your washery or breaker—regardless of size. Find out about Deco's coal flotation test. Write, wire or phone today!



## **TYPICAL DENVER "SUB-A" FLOTATION RESULTS FOR FINE COAL FLOTATION**

PRODUCT	Weight	Analysis	Density
Feed to Flotation.....	100.0	% Ash 23.5	% Solids 20.0
Coal Flotation Concentrate	77.6	6.4	36.5
Refuse Waste.....	22.4	82.8	7.8
Reagent cost per ton of coal concentrate, 6.5c.			
Moisture in filter cake, 21.5%.			
Size analysis flotation feed, 20 x 0 mesh.			



**OUR 25TH YEAR OF FLOTATION ENGINEERING**  
**DENVER EQUIPMENT COMPANY**  
 1403 17TH STREET  
 DENVER, COLORADO

# ROCK RATED!

**P&H**  
**MODEL**  
**955-A**



## **P&H** MAGNETORQUE\*

Just what does Magnetorque mean to you in this great  $2\frac{1}{2}$  yd. shovel? Simply this: It eliminates the old swing frictions with their constant headaches and replacement costs. It gives you the smoothest, slickest swing you ever saw—15% to 25% faster than any other machine of its size—and Magnetorque will last the life of your machine.

Add to this the rugged, rock-rated construction of welded high tensile steels—the

**is the electric swing  
that never wears out**

smooth hydraulic control—the greater stability and digging power—and you have the greater output which means greater profit. Better get all the facts about this outstanding machine—companion to the famous P&H 1055 ( $3\frac{1}{2}$  yds.). Ask about the P&H 955-A today.

\*T.M. of Harnischfeger Corporation for electro-magnetic type clutch.

**HARNISCHFEGER**  
CORPORATION

4540 W. NATIONAL AVENUE • MILWAUKEE 46, WISCONSIN



The rope won't suffer long. First the stretch, then the "bang" as it breaks. Tough on the rope—but it gives us vital information!

## Check and test . . . check and test

In the making of Bethlehem wire rope, quality control is a fundamental point. It is a factor as basic as proper design; it is the core, the heart, of our careful manufacturing methods.

Throughout this program of quality control, many different tests are employed, for no single test will suffice. The one shown here is an excellent example—one that is cruel to the rope but that yields vital facts.

Offhand, you wouldn't think that any machine could possibly break that big, stout Bethlehem rope. It is made of tremendously strong steel wires, and it will lift or support many tons. Yet the machine pictured

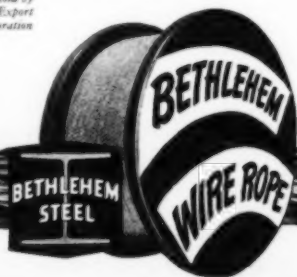
can break the rope in a matter of seconds. Object: to establish the ultimate tensile strength of the rope.

This rigorous treatment is all part of our overall formula. From open hearth to finished rope, it's check and test, check and test. Nothing is left to chance. Because of this attention to detail, you can depend upon Bethlehem rope to do the job expected.

**BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.**

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

**When you think WIRE ROPE . . . think BETHLEHEM**



# Amazing ADDED Feature!

## Bol Tan

sweat-resistant leather insole

gives **HY-TEST Safety Shoes** up to **TWICE THE WEAR!**

Only HY-TEST Safety Shoes have Bol Tan sweat-resistant leather insoles.



Men's Black Cow Brand  
Ankle Flange Steel Toe, No  
Stitching One Piece Steel Toe  
Cap, Steel Toe Cap and Leather  
Full Grained Sole, White Laid  
Steel, Steel Shank, Protective Last,  
Steel Reinforcement.

ACTUAL WEAR TEST PROVES BOL TAN LEATHER INSOLES

### Sweat-Resistant



Here are two insoles from a single pair of shoes worn in a foundry for seven months. The one from the left shoe is a Bol Tan leather insole; the other is a regular quality leather insole.

Note the Bol Tan leather insole is still soft and pliable, shown by cut section lifted for inspection!

The Bol Tan leather insole stays comfortable, permits re-soleing when ordinary insole would have failed!

Ordinary insole is cracked, curled, saw-edged . . . dried out and damaged by perspiration attack!

Ordinary insole is unfit for further wear causing discard of shoe long before uppers are worn out.

Only the Bol Tan leather insole resists the damaging attacks of perspiration!



## HY-TEST



## SAFETY SHOES

\*TRADEMARK REG. U. S. PAT. OFF.

*The World's Largest Selling Safety Shoe*  
Division of International Shoe Company, St. Louis 3, Mo.  
New York Office: Suite 1708, 225 W. 34th St.



Use this handy coupon for details on HY-TEST's Bol Tan leather insoles.

HY-TEST SAFETY SHOES, Dept. C9  
Division of International Shoe Company  
St. Louis 3, Missouri

Please send me free copy of your folder explaining the advantages of Bol Tan leather insoles.

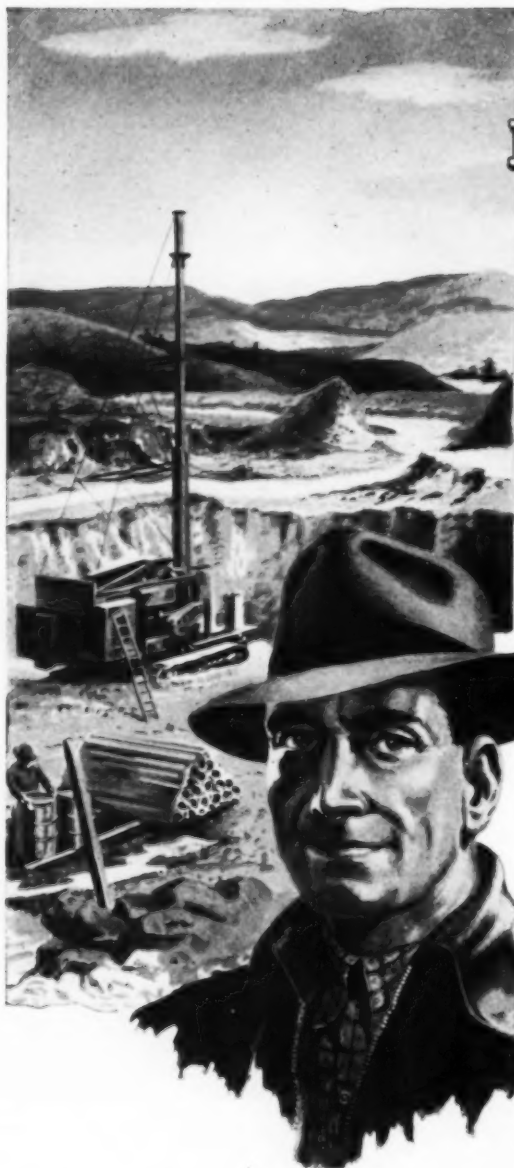
Name.....

Firm.....

Address.....

City.....Zone.....State.....





## PEAK EXPLOSIVE POWER

*In planned shooting you get peak explosive power if you*

**"Hook Up and Detonate with PRIMACORD"**

There's no limit to the number of holes which may be fired at one shot, yet Primacord detonates every cartridge in every hole—no caps in your rock pile. And by proper planning you can shoot the front holes a split second ahead of those in back giving you better fragmentation.

Primacord is easy to handle in the pits for it is light in weight, hooks up quickly in square knots or half hitches, yet can't be detonated without a blasting cap. Stray currents, sparks or even an ordinary shock won't set it off.

Save time and get more effective explosive power with Primacord.

*Ask your explosives supplier  
or write us direct for further facts*

**THE ENSIGN-BICKFORD COMPANY  
SIMSBURY, CONNECTICUT**

**Also Safety Fuse since 1836**

Made in several types. **PLAIN PRIMACORD** for shallow holes and surface trunk lines; **REINFORCED PRIMACORD** for deep holes and resistance to abrasion; **WIRE COUNTERED PRIMACORD** for deep, ragged holes; and **PLASTIC REINFORCED PRIMACORD** for deep, wet holes and river crossings.



*Use* **PRIMACORD**®

*The PROVED and APPROVED DETONATING FUSE*

## Still Elbow Room

"WITH PRESENT high storages and general overproduction, there appears little likelihood that the coal operators can pass on to the consumer any higher costs resulting from wage increases under a new contract."—Marshall Pease Jr., The Detroit Edison Co., chairman, regional coal committee, in *The Bulletin of the National Association of Purchasing Agents*, Aug. 6, 1952.

### Up Again for Costs

The situation highlighted by Mr. Pease's pronouncement is of course no surprise to coal men. In fact, it has been one of the industry's biggest and most-persistent headaches. New throbs are scheduled for 1952, since there seems little doubt that the new contracts will include wage increases and other new concessions that will—temporarily, at least—increase average bituminous costs at least 25c per ton and perhaps 35c or more. In a number of areas and for many properties, the increase will be double or triple these figures or more. And if the pattern is extended to anthracite, the minimum rise will be at least 50c and quite likely the average will be 75c or more for the industry as a whole.

### No New Foundations

The burden, of course, falls heaviest on the commercial producer who stands or falls on what he can get from the customer with a free choice of oil and natural-gas men always at his elbow. That combination has made it tough to get proper realization for years, and 1952 is no exception. In fact, it has provided added complication as a result of the steel strike and other developments. Consequently, even though firmer conditions are expected from now on, bituminous tonnage will

not be much more than 500 million and anthracite will run about even with 1951. Thus, 1952 provided little in the way of new foundations for a proper price level.

### Still the Best Value

But is Mr. Pease completely right that "there appears little likelihood that coal operators can pass on to the consumer any higher costs" resulting from the new contracts? Perhaps there is room for a mild dissent. Operators would rather not have to pass on cost increases, but there is a limit, naturally, to the industry's ability to absorb. More basic in nature, however, is the fact that coal by and large still is the best buy and will remain so for consumers of a large part of the tonnage, even though this fact is not as fully reflected in business for coal as it should be.

### An Ace in the Hole

In addition to the fact that even now it provides better value per dollar in practically every market, coal has a possible ace in the hole. Compared to oil and gas, it still has, through wider use of modern equipment and methods, an opportunity to raise efficiency significantly and thus keep cost and price down, in turn widening the competitive differential. The coming cost increases, on top of all the others of the recent past, can scarcely be viewed with enthusiasm. At the same time, however, management has room to act to offset them—*provided*, they are not too severe and are not merely another in a series of bumps extending indefinitely into the future. That is the real hazard. By restraint in the future, if not now, the union can help make the industry's hole card a real ace.



## Safety Meet With a Difference in Ohio . . .

First-aid proficiency is one major objective. Stimulating safety consciousness is perhaps an even bigger one. The approach is to get every-

body in through baseball, crowning of high-school queen and king, and other events appealing to miners, their families and their neighbors.



# Organizing for Safety

Here's the story of 10 years of safety teamwork in Ohio. It tells...

How to set up an organization that works

Who can help create a real safety program

How to draw everybody into the crusade

What it takes to put safety across

By W. A. STANBURY, JR.  
Associate Editor, Coal Age

ON SAFETY, mine management and the union can work together. And they can get results.

These two facts emerge from 10 yr of cooperation among the Ohio Coal Association, the Safety Directors' Organization of Eastern Ohio and District 6, UMWA. Since 1942, when the operators' association set up a Safety Advisory Committee, and 1944, when company safety directors in the eastern part of the state formed their group, the accident-frequency rate has dropped 52.9%; severity rate, 63.9%; and fatalities per million tons, 73.9%. The union has worked effectively with both organizations.

Here's the record:

## Improving Safety Among Member Mines, Ohio Coal Association

	1941	1951
Frequency rate	76.778	36.140
Severity rate	17.864	6.439
Fatalities per million tons	2.195	0.573

In the first 6 mo of 1952, records of the Ohio Division of Mines show fatalities for all coal mines in the state as follows:

## Ohio Fatalities, First Half of 1952

	Non-Association Members	Association Members
Roof falls	4	0
Machinery, strip mines	1	0
Dust explosions	0	1

State-wide production was 18 million tons, making the fatality rate 0.33 per million tons. Only one of the fatal injuries in the first half of 1952 occurred at mines represented by the Safety Directors' Organization.

Shaping the pattern for cooperation in safety was a trial and error process and it wasn't sweetness and light all the way. But over the years the forward steps far outnumbered the setbacks. Now, though management men and the union don't always see eye to eye on detail, both sides accept the principle that there can be no compromise

where men's lives are at stake. That way, they can sit down together, bring the facts to the conference table and reach decisions that everybody can live with.

These are the elements of the Ohio program:

1. Organizing for safety.
2. Accepting responsibility.
3. Finding leadership.
4. Acting quickly and responsibly.
5. Hewing to the contract.
6. Isolating safety from other issues.
7. Working with all agencies.
8. Enlisting community support.

## How Ohio Got Organized

CREATION of the Safety Advisory Committee of the Ohio Coal Association in 1942 followed a series of distressing mine accidents in the state, disagreement between operators and the union over pending safety laws and the determination of coal operators, spurred by strong leadership, to act constructively on safety.

## Why This Safety Article?

In the February, 1952, issue of *Coal Age*, the editors proposed a Four-Point Safety Program for the industry. These were the four elements of the program:

1. Accept leadership.
2. Organize for results.
3. Bring the miner in.
4. Support safety agencies.

Knowing that action for safety has been increasingly successful in Ohio, a *Coal Age* editor toured the scene to find out what makes safety tick in Ohio. This article tells what he found out. It also shows that the Ohio plan, which gets results, has much in common with the *Coal Age* Four-Point Safety Program.

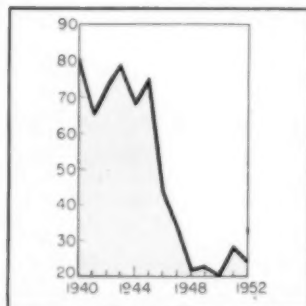
If the plan works in Ohio, why not elsewhere?

## One Company's Safety Director Reported These Injuries At a Meeting of the Safety Directors' Organization

Operation	Date	Occupation	Experience	Days Lost	Injury and How It Happened
Mine A	4/16	Section foreman	24 yr	10	Incomplete fracture left radius, contusion right temporal region with slight concussion. Went to check loader. Piece of stone lodged in hopper and caught timber when operator started conveyor.
	4/17	Operator	5 yr	4	Small laceration behind left ear, abrasion both legs, shock. After loading car out of room, heard shotfirer yell "Fire!" but before he could get in clear shot was fired.
Mine B	4/29	Supply-yard foreman	35 yr	12*	Contusions both legs, sprains both knees. Supply motor pushing post cars around turn. Saw coupler was turned on car and jumped in on tight side to straighten it. Motorman could not stop quick enough and injured was pinned between cars.
Mine C	4/18	Machine helper	30 yr	120*	Lumbar-sacral lesion. Lifting 15-ft timber that was tripped out by stone with loading machine. Putting it back up, strained back.
	4/30	Postman	7 yr	30*	Bruised over entire body, strained right knee. Posting face of room. Shot blew through rib and flying coal struck him.
Mine D					(No accidents)
Mine E					(No accidents)
Mine F	4/28	Truck driver	8 yr	42*	Dislocated left shoulder. Brakes failed. Truck ran in ditch. Bumped left arm against cab.
Mine G					(No accidents)
Machine shop					(No accidents)
Preparation plant	4/8	Mechanic	5 yr	42*	Bruised and sprained left ankle. Was standing on edge stationary railroad car working on boom counterweight. Weight shifted. Lost balance and fell into car.
	4/29	Painter	8 yr	1	Third-degree burns above elbow both arms, first-degree below elbow right arm. Painting tower. Came in contact 2,300 v at transformer terminal on platform.

\* Estimated.

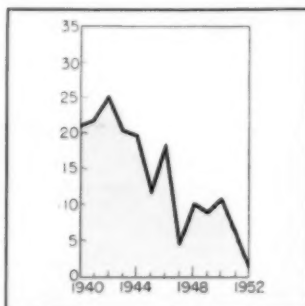
▲ When safety directors present problems and trade answers  
There's a better chance for accident rates to go . . . ▼



### DOWN . . .

Accidents per million man-hr.

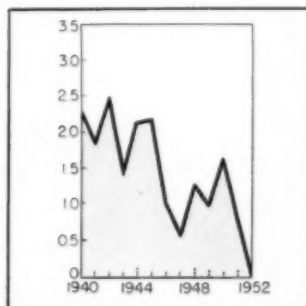
The operators formed their Safety Advisory Committee to assemble and organize data on safety and the causes of accidents, defend the industry against ill-informed allegations, speak authoritatively and responsibly for the producers in public forums—the state legislature, for instance—and promote uniformly high safety standards in member mines. Seven men with long operating experience, plus the labor commissioner of the Ohio Coal Association,



### DOWN . . .

Days lost per 1,000 man-hr.

make up this strong group. By and large, the committee works on the policy-making level and its functions are advisory. But the fact remains that it has a lot of moral punch and its policy decisions are quickly translated into program and action. Selfish interests are submerged in the common cause. Every operator in the association accepts the principle that nothing is to be gained by withholding facts, though the facts



### DOWN . . .

Fatalities per million tons.

may be unfavorable to him or others. The Safety Directors' Organization started out in 1944 as a rather loose association to pool data about accidents and seek and discuss methods to prevent them. In 1946 the structure of the group was tightened up, a regular schedule of meetings was fixed and, at the invitation of the Ohio Coal Association, the safety men started holding their gatherings in the office of the operators' labor commis-



stoner, who was placed at the service of the safety directors. The result has been a close tie between the two management groups, with information flowing freely between them. Now there are 13 members of the organization. Every safety director in eastern Ohio belongs, irrespective of whether his company is a member of the Ohio Ohio Coal Association.

At monthly meetings of the safety men, each member tells about accidents that occurred at his mines during the preceding month. He tells what he is doing to prevent accidents of the kind described or, if he has no solution, asks for help from the other men present. The free exchange of facts provokes friendly competition, with each man trying to outstrip the others in improving the record. Discussions are limited to safety. There's no talk about contract issues.

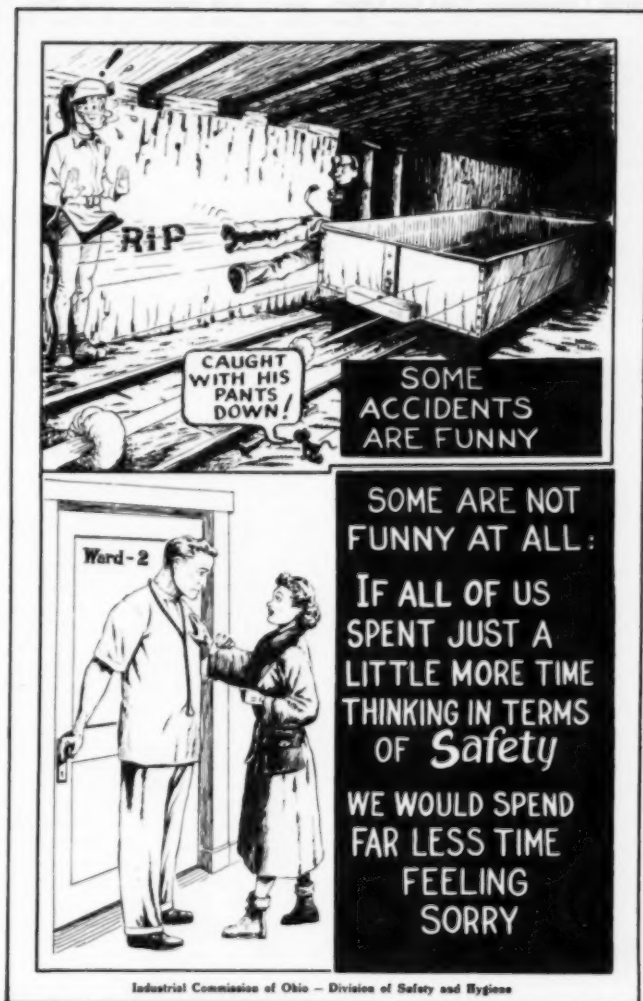
The safety directors take special pride in their safety posters. Twice each month there's a new one to be distributed to all mines in Ohio. The posters are designed by J. W. Greaves, an experienced miner himself and safety adviser to the Ohio Division of Safety & Hygiene. Mr. Greaves attends the regular meetings of the safety directors' association, takes part in the discussions and from his knowledge of accidents that are fresh in the memory of all, draws the cartoon that tells the bi-weekly poster message.

On its side, the union also is organized for safety. The district president has divided his region into four areas. In each area he has named a union official to be responsible for safety. The district president rides herd on the area men. They in turn keep mine safety committees on the alert and maintain close contact with mine officials.

## Taking the Lead in Action

MANAGEMENT AND UNION MEN alike accept responsibility for safety. Company men from the top level to the face foreman are convinced that workers will follow the lead of management in safety. That's why management men assume their share of the burden, especially in preventing disasters. As one top company official put it, "In every major disaster, management must bear the full responsibility."

This attitude makes it obligatory upon management to create a real safety program, sell it to workers and put it to work. The program covers all bases—machinery and equipment,



**SAFETY POSTERS** like this one are drawn from accidents described at monthly meetings of the Safety Directors' Organization.

mining methods, maintenance, training and public relations. Policy is determined by the Safety Advisory Committee of the operators' association. The committee passes policy on to the association itself, and member-company presidents translate it into program in their own companies. Detailed administration falls to the men at the mine—superintendents, safety engineers, mine foremen and section bosses.

The union, like the operators, pulls its share of the load. The welfare of its members—safety as well as wages—is the union's reason for existence.

That's why the union moves in fast on every situation involving danger to its members, whether management or miners are responsible. The union shares with management the view that though their paths may diverge in some matters, safety is one road they must travel together.

Strong leadership is a prime factor in safety. Men are needed who face facts, act on them promptly and lead other men down the same road. The operators' Safety Advisory Committee is made up of such men. Chairman of the group is James Hyslop, president, Hanna Coal Co. Div., Pitts-

burgh Consolidation Coal Co. Others are Paul Allen, general manager, New York Coal Co.; P. C. Beutel, general manager, Columbia Southern Chemical Corp.; George Phillips, general superintendent, Warner Collieries Co.; Taylor Roy, general superintendent, Cambria Mining Co.; E. G. Schell, general manager, Lorain Coal & Dock Co.; Morgan Williams, general superintendent, David Z. Norton Co.; and Ford Sampson, the association's labor commissioner.

Coming to Ohio in 1940, Mr. Hyslop straightway asserted a strong stand on management's responsibility for

safety and made it clear that this theory was to be emphasized in the policy of his company. He believes that 85% of all trouble at coal mines arises from misunderstanding. Thus he directs his energies at creating understanding through seeking the facts and laying them on the table. "It's better to settle issues with facts than with headlines," he explains.

Mr. Sampson, secretary of the advisory committee, is the busy contact man on safety. With experience as a miner, a foreman and a district union official, he understands the motives and needs of labor and management.

He believes that the views of both sides can be reconciled by bringing the facts to light. He believes in prompt, straightforward action. If safety work adds to his tasks as labor commissioner, that's the way he wants it. "A labor commissioner," he says, "ought to know everything that's going on in his district." Knowledge of what's going on shows him where sensitive pressure points are if he needs to press someone who is slow to act. In behalf of the advisory committee, Mr. Sampson checks up on safety violations cited in the reports of federal mine inspectors.

## Union and Company Work Together

THE OPERATORS have no monopoly on leadership. Adolph Pacifico, district union president, sees his job this way: "I want the companies to stay in business and operate smoothly. That way, miners work steadily, have good jobs and live long lives. That's what I tell my lieutenants and the miners." With that approach, he steers his organization firmly.

Quick, positive action demonstrates that operators and the union alike believe in safety. "When it's a question of safety, you move fast and forcefully," Mr. Sampson says.

Copies of the reports of federal inspectors on all member mines are sent to Mr. Sampson's office. In this way, the operator's Safety Committee always is informed on safety conditions in association mines. These reports also enable the commissioner to be of service in advising with individual mine superintendents on specific mine-safety problems brought to light by

federal inspections. Whenever it is deemed necessary, the labor commissioner contacts mine management directly.

Mr. Sampson takes no action on reports covering mines that are not association members. But through the Safety Directors' Organization he meets safety men from several non-member companies. When they ask for his help, they get it.

Mr. Pacifico's area officials also work fast on violations. If the violation looks serious, Mr. Pacifico demands a report from the local mine safety committee within a week. If that report doesn't show up on time, the area official takes over, spurs the safety committee and seeks action directly from the superintendent.

With fast, effective action like this, there's neither time nor reason for safety questions to get muddled up with other issues that sometimes split men and management. In addition,

with both sides accepting the fact that they can—and must—work together on safety, though they may divide on other questions, safety doesn't become controversial. True, there have been instances where the mine committees have confused contract grievances with safety problems. UMWA district officials, quick to sense the dangers of such a practice and realizing that it would retard rather than promote safety, unhesitatingly took decisive action that completely separated safety problems from unrelated contract-grievance cases.

Hewing to the contract also keeps safety out of disputes. As Mr. Hyslop sees it, "The Federal Mine Safety Code is written into our contract. No operator gains anything by trying to evade any part of that code."

Mr. Pacifico sees it much the same way. He says, "The contract is reasonable and fair and both sides have agreed to it. I never ask the operators for anything that's not in the contract. But I do insist that they work by the contract and the Code."

## Bringing Everybody In

COAL MEN IN OHIO overlook no source of help on safety. There are plenty of these sources: the Safety Advisory Committee, the Safety Directors' Organization, the UMWA, the Bureau of Mines, the Ohio Division of Mines and the Ohio Division of Safety & Hygiene. All pull together. There are plenty of matters on which they can, and do, work together—safety legislation, to mention only one.

If Ohio has a good mining law—most people believe it has—it's because coal men made drafting the law a joint project. Mr. Hyslop, testifying recently before a committee of the United States Senate, explained how the Ohio law was framed. He said: "In the State of Ohio we have from time to time revised our law, and just 2 yr ago we revised it to strengthen it. That work was done with the full

cooperation and collaboration of the state department, the operators of the state and the mineworkers of the state. We agreed as to what should be done. We asked the legislature to do it for us. And they did it promptly. I think we now have a good law. . . . The mines in Ohio are being inspected much more carefully and effectively than they were previously."

Mining men in Ohio also seek the participation of people in the community. By community, they mean everybody—operators, management, miners, union officials, children, families, neighbors and friends.

Here are some of the ways in which they gain community support:

### 1. High-school mining classes

Some companies sponsor mining classes for high-school youngsters.

One effect of these classes is to drill safety into the thinking of boys who may turn to mining as a vocation or make their living in mining towns. Another effect is that students take home to parents and elder brothers the latest word on safe habits and safety equipment.

### 2. Teamwork at the mine

Some companies urge their officials and supervisors to seek contact with union men. "It's not enough to believe honestly in safety. You've got to demonstrate your belief openly and repeatedly," Mr. Hyslop says. One result of management's repeated show of belief in safety is that union men at the mine now show their confidence in management. Safety committeemen, for example, often ask the companies' safety directors for help in supplying information for speeches they are asked to make at safety meetings in town. Safety directors welcome these

requests and take them as opportunities to urge the men to study for state certification. One effect is a realization by local union men that management and workers are in safety together and that each has a stake in reducing accidents. Another effect is this: Once it's clear that safety questions can be solved jointly, it becomes easier to work out other problems together.

## Safety Meet With a Difference

HERE'S HOW the safety meet works:

### Planning and running the meet

Leader in planning the big event is the Safety Directors' Organization. They find it's a year-round job. They do their work through committees—committees on arrangements, rules, prizes and other matters necessary for staging the meet. They bring in the Ohio Division of Safety & Hygiene to help. They consult district union officials at all stages. And when the time comes for the meet, inspectors and other officials of the Bureau of Mines act as judges. Men from the Ohio Department of Mines work with the arrangements committee and, like the USBM men, help in officiating. The Industrial Commission of Ohio helps sponsor the meet.

### Getting out the crowd

The meet always is held on Saturday, when the mines aren't working. That enables the 10,000 miners in eastern Ohio to attend if they want to—and many of them do. They bring families and friends along because there's something for everybody to see and do. It's an all-day affair. The big drawing cards are radio and stage stars, circus acts, and raffle prizes ranging from an automobile down to thermos jugs and fishing rods.

To bring high-school youngsters out, officials crown a king and queen of safety. Candidates are selected in earlier stages by students in 25 high schools in the area. Final selection is made by lot.

## What It Takes to Get Teamwork

TEAMWORK IN SAFETY doesn't come by wishing for it.

Go back to the beginning of this article on safety teamwork in Ohio. It takes organization, acceptance of responsibility, leadership, prompt action, respect for the contract, isolation of safety from other issues, use of all available safety agencies and community support.

But teamwork for safety requires something more, too. It requires these things, among others:

### 3. Safety training

It's good to train miners in safety. It's better still when miners' families and neighbors also are trained in safety. Some companies have long offered safety courses to their men. Recently, seeing an opportunity in Civilian Defense to reach more people, one company threw its first-aid classes open to townspeople. The upshot is that wives

and children are safety conscious and that there's pressure on miners from the folks at home to work safely.

### 4. Joint enterprises

Getting everybody into the act is a big factor in safety promotion. That's the primary purpose of the annual Eastern Ohio Safety Meet, held each year in August.

### Financing the meet

Running off the meet, staging the events and providing entertainment costs between \$12,000 and \$15,000. The money comes mostly from raffle tickets. Part of the gross take goes to the baseball league.

### Adding up the gains

What good are safety meets? Are they anything more than a chance for a few selected men to show off their skills?

Men in Ohio think there's a lot more than that to safety meets. Here are some of the benefits they see:

1. A safety meet gives contestants a goal through the year—to be the best team on the lot. Rivalry is friendly but intense. That means better-trained teams if real emergencies arise at the mine.

2. A safety meet spurs pride among the contestants. With 12,000 or more people turning out to watch and applaud, a man has a right to be proud of his industry as well as his skills.

3. A safety meet stimulates favorable public opinion for the industry and its people. The way the event is run off in eastern Ohio shows that nobody is dragging his feet on safety and that everybody is in the act—mine owners and officials, workers, the union and state and federal agencies.

4. A safety meet creates momentum for safety. It stretches safety consciousness among participants and witnesses through the year until the next meet.

### 3. Courage

It sometimes takes blunt talk to meet the safety issue squarely. There may be times when you have to talk bluntly to your associates and your neighbor companies. That takes courage. And you may have to listen to blunt talk. That also takes courage.

### 4. Enthusiasm

You've got to believe in safety. You will believe in it if you accept the fact that safety is the common denominator for low accident rates, good morale among workers, smooth labor relations and high efficiency.

### Getting down to safety business

The contest for the safety championship brings together 14 to 16 first-aid and rescue teams in the evening. The contest is run off quickly and efficiently, so that no one need risk his neck racing home. The first-place winning team gets a plaque from Mine Safety Appliance Co.; the second-place team, a plaque from the National Coal Association. Each member of the top team gets a new suit and hat. Second-place team members get wrist watches; third-place men, two pieces of luggage; and so on down the line.

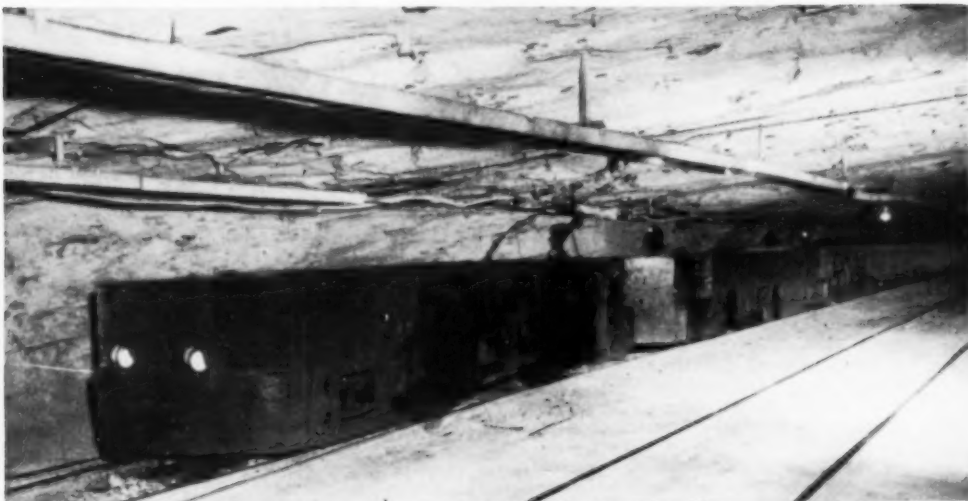
The four highest-scoring teams participate in the All-Ohio Safety Congress, held in Columbus the following April. The winning team there is declared state champion of the year. The All-Ohio Congress is an annual event sponsored by the Industrial Commission. The Safety Directors' Organization, with the UMWA, Ohio Division of Mines, USBM, Division of Safety & Hygiene and the Ohio Coal Association, also plans and conducts the coal-mine-section meeting, where papers on safety are presented by various groups, including UMWA mine-safety committees from various mines in the state.

### 1. Honesty

When you talk about safety, you bring all the facts to the table—even those that hurt. And when you're wrong, you admit it and move fast to right the wrong.

### 2. Hard work

Keeping a mine safe is not easy. You've got to be vigilant. You've got to inspect your mine and make changes and think up new ways to keep interest high. That's hard work.



**HAULAGE ECONOMIZER**—New three-unit locomotive handles more tons per shift while replacing four and sometimes five locomotives previously required. It pulls 40-car trips over new heavy-duty main line.

## How Mulga Modernized

**One-third more output with one-fifth the manpower follows haulage modernization program based on belt slope, big cars, heavy-duty main line and three-unit locomotive.**

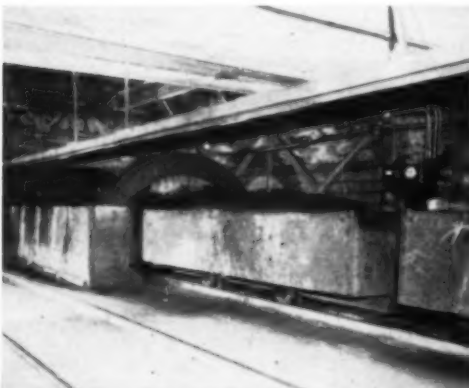
A BELT SLOPE, a modern heavy-duty main line and 9-ton mine cars, topped off by a 48-ton three-unit haulage locomotive, have been the answer to a production bottleneck and low-

cost transportation at the Mulga Mine of the Woodward Iron Co., Mulga, Ala.

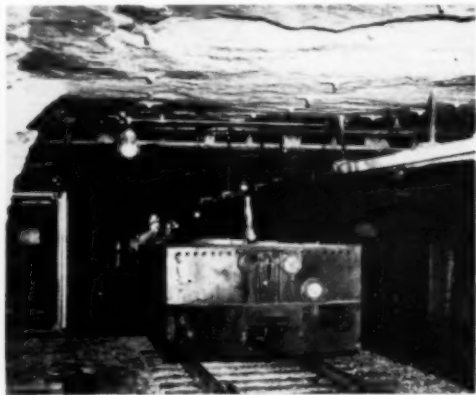
Initiated in 1949 by the Woodward management, including B. C. Colcord,

president; Hewitt Smith, vice president; and John W. Hager, chief mining engineer, the haulage program has enabled Mulga to increase its production 33½%. Present output will be increased to a maximum of 7,000 tons per day when necessary by adding additional loading units.

The original shaft, tippie, steam hoist and boilers were erected at Mulga in 1912. This shaft was designed with two compartments, each with a double-deck cage. The 2-ton



**ONE-MAN BOTTOM** includes rotary dump with car feeder and pushbutton control station. Sprays in the dump keep down dust. New locomotive (right) is heading back with trip of empties under pin-timbered top.







**BOTTLENECK BREAKER**—New slope belt with a capacity of 600 tph permitted major increase in mine output with only a fraction of the manpower. It discharges to a new surge bin and feeder installation on the surface.



## for Haulage Efficiency

mine cars were hoisted to the surface in balance on the top deck, the empties returning on the lower deck. With the exception of a few minor changes, this plant operated as originally installed until the changeover to the new belt haulage in the latter part of 1950.

Before modernization, four and sometimes five locomotives and 8 to 10 men per shift were required to deliver 3,400 to 3,500 tons to the shaft bottom. Now a single three-unit locomotive with two men per shift delivers

4,500 tons, hauling from  $4\frac{1}{4}$  to  $4\frac{1}{2}$  mi.

The original hoisting shaft limited the size of mine cars that could be hoisted, in turn limiting the haulage capacity underground. In addition, seven men were required per shift for hoist operations, caging top and bottom, and dumping and hoisting. Also two firemen were required on the boilers. With the slope belt and underground dump, the coal is handled by two men per shift.

The loading operations at Mulga

were completely mechanized several years ago. As each section was mechanized, 6-ton dropbottom cars were put into service to serve the track-mounted loaders at the face. The coal was transferred from the larger dropbottom cars to the smaller wooden cars at central points near the working sections for transportation to the shaft bottom and hoisting to the surface.

### SLOPE BREAKS BOTTLENECK

After the face-loading operations were completely mechanized and plans were under way for an additional furnace requiring additional coal, it became necessary to complete the projected modernization program at Mulga. The small cars on the main line and the limited and expensive hoisting operation had long been considered a bottleneck. Plans had been made to drive a slope for belt haulage to the surface with the necessary improvements in haulage tracks and equipment.

The work was started in late 1949 and the new belt placed in operation in November, 1950.

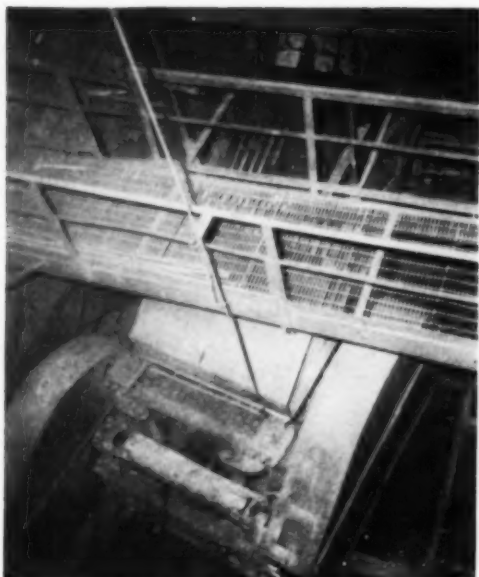
The length of the slope, sunk near the old hoisting shaft to feed through the existing screening and loading facilities, is 970 ft. Cover depth at the slope portal is 180 ft to the 6-ft Pratt seam, one of the principal coking-coal producers of Alabama. Including the surface run, total length of the slope conveyor, on a 16-deg inclination, is 1,057 ft.

Slope sinking and pocket excavation were done by Christie-Hutchinson &



**HEAVY-DUTY MAIN LINE** features 90-lb rail, treated ties and pin timbering. It gets its share of the 15 lb of rock dust used per ton.

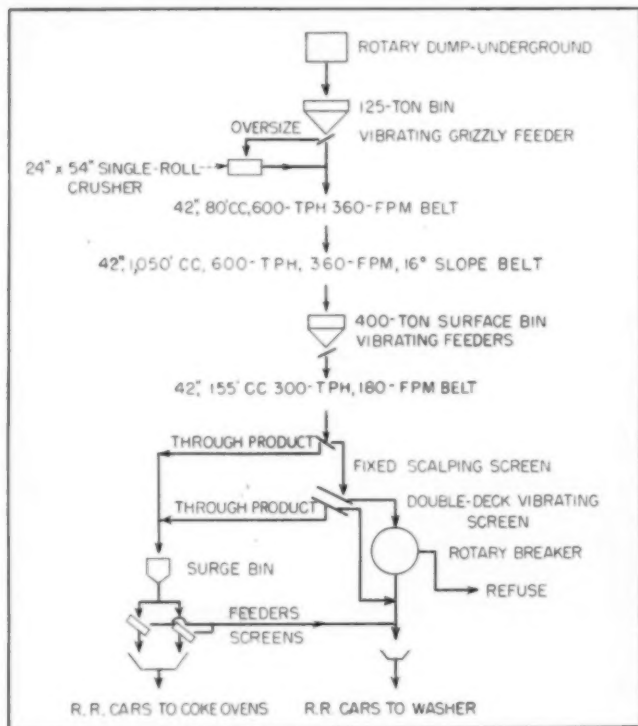




**GRIZZLY AND CRUSHER** follow 125-ton dump hopper, with crusher functioning primarily as rock-breaker.



**MAGNETIC METAL DETECTOR** on cross belt feeding main belt shuts down belt for protection of main slope belt.



**HOW MULGA COAL** flows from the new rotary dump to the railroad cars.

Burton Co., Inc., Birmingham. The slope was driven 6x12 ft with a slusher for mucking. The slope-portal concrete was extended down the slope a short distance. From this point, the top was pin timbered using 5-in channels spanning the slope on 4-ft centers.

The Continental Gin Co., Birmingham, furnished and installed all the conveying machinery, including the structural supports. The slope belt is a Goodyear Compass unit running at 360 fpm with a capacity of 600 tph. The belt was placed in the center of the slope, permitting a walkway on each side.

#### **CRUSHER FOLLOWS DUMP**

A Link-Belt single-car rotary dump equipped with sprays and preceded by a Link-Belt car feeder dumps the 9-ton cars into a 125-ton surge bin, or pocket. A Jeffrey-Traylor heavy-duty grizzly feeder with variable-speed control feeds the coal out of the bin. The minus 6-in falls through the grizzly bars onto a short (80-ft) cross belt feeding the main slope belt. The plus 6-in material, mainly consisting of large parting rock, passes over the grizzly into a 24x54-in single-roll McLanahan & Stone crusher, set at 8 in.

The cross belt is equipped with a Dings High-Intensity magnetic metal detector, which is set to stop the belt automatically and give a signal if large pieces of iron or steel have been loaded with the coal. The metal is re-



**MULGA MANAGERS**—W. B. Abercrombie (left), haulage foreman; J. R. Baker, asst. mine foreman; W. T. Evans, general mine foreman; and T. H. Kirk, supt.

moved by hand, thereby protecting the main slope belt and tippie equipment.

The main slope belt discharges into a 400-ton surge bin, from which the coal is drawn at a uniform rate for feeding a Bradford breaker. The breaker removes a large portion of the rock. The coal from the breaker is shipped via Woodward R. R. to the central washer at the Woodward By-Product Plant.

#### **HAULWAY FOR HEAVY DUTY**

The Mulga openings are near the east end of the property, with the coal dipping slightly to the west. The main line extends generally west through the center of the property. To fit it to deliver a high tonnage with large cars, it was completely rebuilt.

The basis for rebuilding the 44-in-gage track was 90-lb rail on 6x8-in by 6½-ft crossties laid on 24-in centers in slag ballast. Since the majority of the rebuilt track was through old works it was necessary to regrade, brush and widen where necessary to take care of the larger haulage equipment. The haulage road was retimbered with 4-ft wedge-type bolts with 6-in bearing plates on 4-ft centers. Occasionally the bolts are supplemented with channels. Rails are connected with six-bolt angle bars, and curves are superelevated for smooth high-speed operation.

Substations are placed on the sur-

face and DC power enters the mine through boreholes from five 300-kw, one 200-kw and one 125-kw sets. The main line is equipped with 6.0 trolley paralleled by million-circular-mil feeder.

Although operation with only one haulage unit simplified the control of main-line traffic, a dispatcher still is employed, though his job is primarily controlling traffic within the working sections, where Woodward-made block signals supplement dispatcher operation. On the main line, trip movement and the movement of other equipment is facilitated by Canton electric switch-throwers on all principal switches, which are equipped with indicating lights. A few electrically controlled derrails are provided for protection at strategic points on the main line. Lighting on the bottom and in the belt openings is provided by Crouse-Hinds vaporproof fixtures. Traffic control and general communication is facilitated by Femco trolleyphones.

★ ★ ★ ★ ★

#### **Aint It So**

Bathing suit—a utilitarian garment cut down to see level.

★ ★ ★ ★ ★

#### **THREE-UNIT LOCOMOTIVE PROVIDES HIGH CAPACITY**

The three-unit locomotive now handling main-line haulage at Mulga plus 200 9-ton steel mine cars and eight 32-man mantrip cars comprise the new rolling stock installed as part of the Mulga modernization program. The locomotive normally pulls trips of 40 cars with an average load of 8.2 tons per car. The 4-wheel ACF cars are of solid-body construction with Timken-equipped cast-iron wheels and Wilison automatic couplers.

The three-unit locomotive replaced three 15-ton locomotives, one 20-ton tandem and one 10-ton spare or extra unit. To make the three-unit locomotive, one new 15-ton Westinghouse locomotive was bought with master control. In addition, a second control unit was bought for one of the 15-ton locomotives already on the job. Purchase of this extra control unit was a result of a decision to keep one spare locomotive unit to facilitate inspection and maintenance. In line with this decision, one locomotive of the three is removed from service each week for maintenance, which facilitates keeping the entire unit in tiptop shape—an essential consideration when one unit is responsible for the entire main-line movement of coal.

The desired speed was 12 mph with full load, and this necessitated changing the gear ratios and resistances in the old locomotives. The control and service equipment includes air-operated contactors, air braking and air sanding. All work in connection with fitting the locomotives for three-unit operation was done by the Mulga-mine maintenance crews. All old locomotives, main-line and gathering, had to have automatic couplers added.

The individual locomotives are two-motored units, with each motor rated at 120 hp. Thus, the total rated horsepower for the entire machine is 720, sufficient to move substantially more than the 40 cars normally hauled. However, for the present, 40 cars is regarded as a practical size of trip and avoids heavy loading of the haulage unit. This in turn has almost completely eliminated sanding and with it tire wear. Before, trucks frequently had to be removed in as little as 6 wk for reconditioning.

The coal reserves at Mulga are extensive, and this modernization program, initiated in 1949 and completed in 1950, enables this mining operation to proceed with adequate facilities to efficiently produce the outputs, over a long period of time, necessary to maintain the proper relationship between coal tonnage mined and the expanding production of Woodward's pig iron and coal by-products.



Saxton's BIG PICTURE of high efficiency . . .



# Narrow-Cut Stripping And Calcium-Chloride Washing

**Saxton Coal's washery; the first calcium-chloride unit in Indiana, produces 260 tph of uniform-quality coal, which is efficiently stripped from the Indiana No. 5 seam in 36-ft-wide cuts.**

SERVING A MARKET that demands a uniform product from day to day is not too big an order in most instances. When mechanical cleaning is indicated, however, and water and refuse areas are at a premium, the problem takes on a different complexion. The Saxton Coal Corp., Petersburg, Ind., serving Indiana customers with washed coal from strip mines in the Indiana No. 5 seam through the Midwest Fuel Co., Indianapolis, faced these problems and others.

The company's coal reserves lie in widely separated tracts—so far apart that the construction of a central plant to serve all future operations was not feasible. Furthermore, at the time the cleaning plant was planned, structural steel was not plentiful and circumstances did not permit waiting for it to become plentiful.

Working with engineers of the Templeton-Matthews Corp., Terre Haute, Ind., Saxton officials—Kenneth Youngs, president; Bernard Youngs,

vice president; and Darwin Youngs, general manager—figured it out this way:

A portable plant, constructed of timber and equipped with a Belknap calcium-chloride washer, would go far toward solving the problems of widely separated coal tracts, steel shortages and the demands for washed coal of uniform quality. In addition, the calcium-chloride process is economical in the use of water and reclamation of the medium requires no extensive settling ponds or dams. As a bonus, the product would be dustless and freeze-proof.

Regarding the problem of refuse-disposal, it was calculated that the haulage trucks which bring raw strip coal to the plant could return plant refuse (12% of the total feed) to spoil areas in the strippings.

So the Saxton plant, near Oakland City, Ind., features a calcium-chloride washer, rated at 220 tph and successfully operating at 260 tph, manu-

factured by the Fuel Process Co., S. Charleston, W. Va. The unit, which is one of the largest ever made by Fuel Process, is the first calcium-chloride washer in Indiana.

## NARROW-CUT STRIPPING

The tract now being stripped consists of 400 acres of the 45-in No. 5 seam. The coal is virtually level and lies under from 20 to 60 ft of overburden. The top 12 ft is soft material that requires no shooting, but the remainder is shale that must be blasted. Current rates of production, under about 35 ft of cover, are 15,000 cu yd of overburden per 24 hr (6-day week) and about 1,700 tons of raw coal per day, from a single loading shift. Operations in this vicinity have a life-expectancy of about 10 yr.

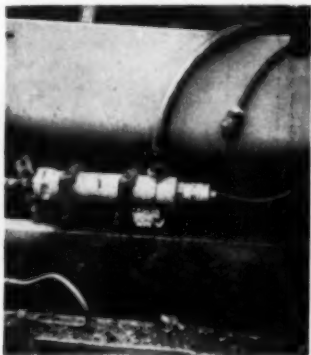
Saxton stripping, under the supervision of A. E. Ellis, general superintendent, and Hubert Youngs, pit superintendent, is based upon the narrow-cut principle. In this method, the initial overburden cut is 60 ft wide but all following cuts are only 36 ft wide. All coal-loading cuts including the first one are 36 ft wide.

Besides leaving a 24-ft-wide haulage way on top of the coal, this system permits the stripping and loading units to spend most of their time in productive work. In the narrow cuts, both the Marion 7400 electric drag-

**... is a composite of smaller applied ideas—like these**



**FASTER HAULAGE** is promoted by self-cleaning treads across plant-feed hopper. Loaded trucks run straight across without maneuvering and automatically set treads in place for dumping.



**ELECTRIC ENGINE HEATERS** permit faster starts on cold mornings and reduce wear and tear on truck engines.



**13-YD DRAGLINE** (left) opened the pit with a 60-ft-wide cut. In succeeding cuts the dragline and loading shovel remove 36-ft-wide swaths, the shovel leaving a 24-ft haulway on top of the coal against the highwall.



**SAXTON "SUPERS"**—A. E. Ellis (left), general superintendent, and Hubert Youngs, pit superintendent, keep the job on schedule. Both have been affiliated with the company for approximately 20 yr.

line with a Page 13-cu-yd bucket, and the Bucyrus-Erie 54-B electric loading shovel with 4½-cu-yd coal bucket, work at peak efficiency because there is no time wasted in lateral maneuvering. Both units travel along and operate from the centerlines of their respective cuts, so with only 18 ft to be worked on either side of the centerlines much nonproductive swingtime is eliminated from the cycles.

In stripping, the narrow cut offers another advantage. The dragline with its 160-ft boom can easily stack the overburden in the spoil area without any rehandling and at a distance that will prevent the spoil from dribbling back over the edge of the coal.

#### **DRILLING, SHOOTING, HAULING**

Horizontal drilling in the highwall is done with a shop-made drill pow-

ered by a Ford V-8 engine and equipped with hydraulic feed auxiliaries. A 2-man crew, working one 7¼-hr shift per day, keeps ahead of the dragline by drilling from 16 to 20 5-in holes 36 ft deep on 18-ft centers. The drill is equipped with a Parmanco auger chuck and Parmanco bits.

One shift a week is given over to blasting the highwall. From 3 to 5 holes, containing from 500 to 700 lbs of du Pont El-401 in 5-in cartridges, comprise a single shot. The charge is detonated through Primacord, with



#### **The Facts in the Case**

The bee has a stinger only 0.03125 in long. The other 3 ft is pure imagination.

MS connectors between holes to provide the advantages of short-delay shooting.

Coal is broken up ahead of the loading shovel by drilling vertical holes with another shop-made drill rig and charging the holes with Strip Coalex (U. S. Powder Co.). The coal drill is powered by a Briggs-Stratton engine.

The top of the seam is cleaned before shooting by a rubber-tired International I-4 dozer, which does an effective job without sacrificing coal by digging into the top.

Nine rear-dump International L-194 trucks, each with a capacity of 12 tons, haul the raw coal 4 mi to the cleaning plant.

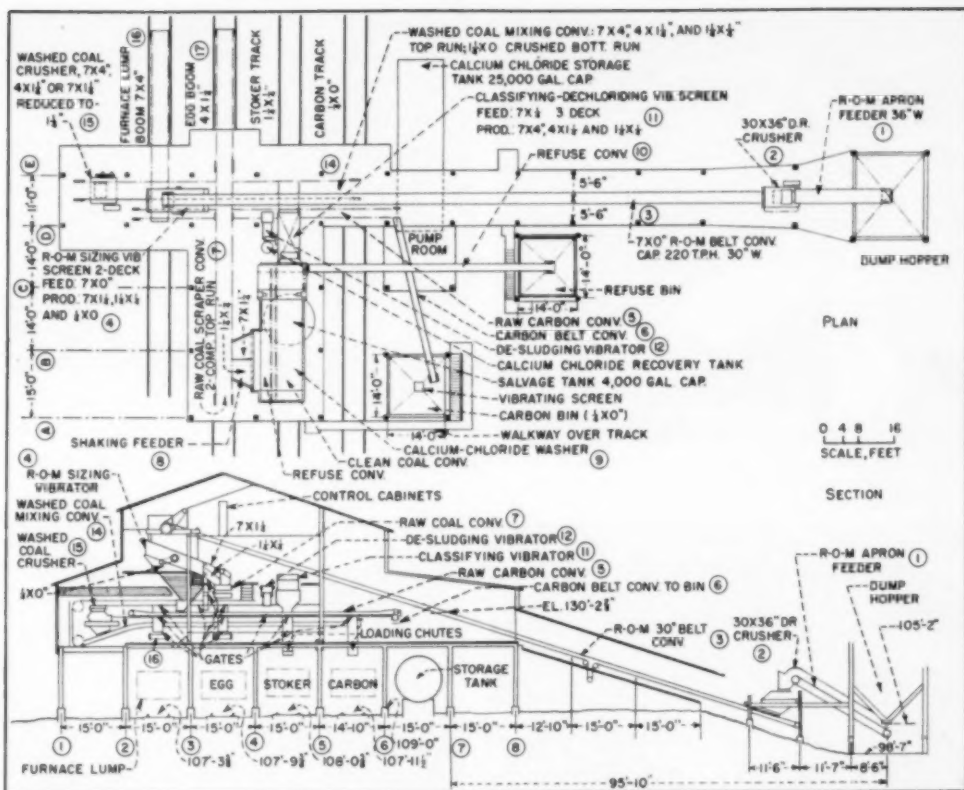
In the pit, the trucks travel on top of the 24-ft coal bench because fire-clay under the seam will not carry the traffic satisfactorily.

As shown in the illustration, trucks are loaded as they face the exit from the pit, the 24-ft haulage way being wide enough to permit empty trucks to pass into the 60-ft-wide section of the pit to turn around. Both in the pit and at the preparation plant haulage routes are designed to eliminate the need for maneuvering loaded trucks.

#### **CLEANING THE COAL**

At the plant the loaded trucks dump the raw coal into a 50-ton hopper which is sunk below ground level. The steel truck ramp across the top of the hopper is a self-cleaning installation to permit the coal which is dumped on the treads to be tilted into the hopper. As shown in the photos, the weight of the truck holds the treads in place during dumping, but when the truck leaves the ramp steel-rail counterweights tip the treads to clean them off. The following truck depresses the treads to their normal traffic position.





**EQUIPMENT AND STRUCTURE** of the 260-tph plant are designed to permit ready disassembly and re-erection for future moves. Saxton's reserves are widely separated making impractical a central plant location.

Raw coal is fed from the hopper to the 30-in plant feed belt through an apron feeder and a Jeffery 30x30-in double-roll crusher which crushes to minus 8 in.

At the top of the plant the belt discharges to a double-deck 5x14-ft Allis-Chalmers Ripl-Flo screen which removes  $\frac{3}{4}$ x0 raw carbon from the washery feed and separates the remainder of the raw coal into 8x1 $\frac{1}{4}$  and 1 $\frac{1}{4}$ x $\frac{3}{4}$  fractions. These two splits are carried to the washbox vibrating feeder in separate compartments of a scraper conveyor.

The calcium-chloride washer operates at 1.5 specific gravity to produce coal of consistently uniform quality as demanded by the company's commercial and industrial customers.

Refuse from the cleaning unit is discharged to a scraper conveyor which carries the waste to an elevated bin from which trucks are loaded for the return trip to the spoil areas in the strippings.

Clean coal is discharged by the

clean-coal conveyor of the washing unit to a 5x12-ft triple-deck Ripl-Flo vibrator which sizes the washed coal into 8x4 furnace lump, 4x1 egg and 1x $\frac{1}{4}$  stoker coal. The underflow of the vibrator is desludged on a Syntron vibrator with  $\frac{1}{2}$ -mm cloth which removes most of the solids from the medium before it is stored for recirculation in the calcium-chloride recovery tank.

The prepared sizes from the triple-deck Ripl-Flo are chuted to separate sections on the top run of a three-compartment distributing conveyor which discharges through bottom gates to the loading booms or chutes. However, if demand for washed screenings (minus 1 $\frac{1}{4}$ -in) is great, the top run discharges to a single-roll Jeffery washed-coal crusher which deposits minus 1 $\frac{1}{4}$ -in washed screenings in the bottom run of the distributing conveyor. The bottom run also discharges through gates to the loading booms or chutes.

Raw carbon (minus  $\frac{1}{4}$ -in) from the

ROM sizing screen may be loaded directly from the raw-carbon conveyor or carried to a storage bin on an auxiliary belt conveyor.

#### CONSERVING WATER

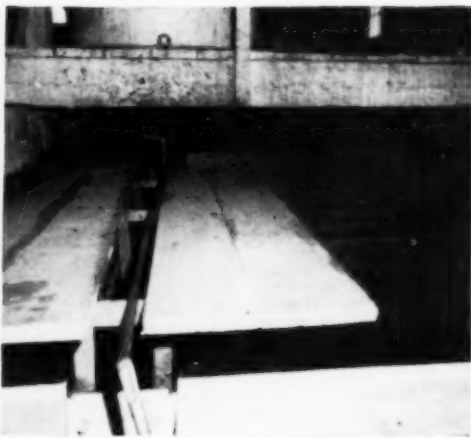
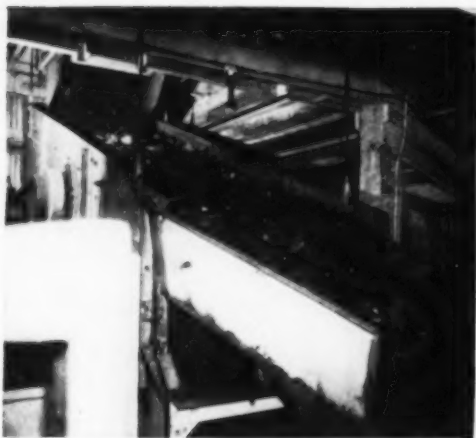
The calcium-chloride circuit in the plant includes three tanks, as follows:

A 25,000-gal storage tank at ground level receives the solution from the railroad tank cars in which it is shipped to the plant.

A 1,000-gal gravity-feed tank above the washing unit holds make-up solution, which is pumped as needed from the main storage tank.

A 4,000-gal salvage tank under the washbox periodically receives the entire charge of the washing unit to permit fines to be settled out. The clarified solution then is returned to the washer. This is done about every 2 mo as a week-end operation.

Through such economy practices, consumption of water is kept to a minimum. Company records show that about 10 gal of water per ton of clean



**RAW-COAL VIBRATOR** (left) is fed by 30-in main belt and discharges presized feed to calcium-chloride washer (right), which discharges refuse via the conveyor on the left and clean coal via the wider conveyor at right.



**TRIPLE-DECK VIBRATOR** sizes washed coal and feeds prepared sizes to separate compartments in top run of distributing conveyor (right photo), which discharges to loading booms or chutes.



**WASHED-COAL CRUSHER** (left) crushes lump and egg to minus 1½-in washed screenings, when necessary, and discharges the product to bottom run of distributing conveyor, which serves the loading booms and chutes (right photo).

coal is lost from the circuit, and calcium chloride is consumed at a rate of from ½ to 1 gal per ton. This is intentional and controlled, however, to provide the desired dustless, nonfreezing product.

#### PERSONNEL AND SERVICES

Seven men operate the cleaning plant on a single-shift basis. Their duties are as follows:

One man operates the various units from the master control panel, and another oversees the operation of the washbox. One man cleans and otherwise prepares railroad cars for loading, while two others drop the cars under the plant and load them. One mechanic works night shift on general plant maintenance and one man is employed as a general day-shift laborer. Loran Day is preparation superintendent.

At the strippings, 34 men are employed as follows:

Three operators and three oilers on

the dragline (three shifts), one operator and one oiler on the shovel, one D-7 operator, one L-4 operator, two coal drillers, three overburden drillers, one pumper, one welder, three mechanics, one serviceman for trucks, 10 heavy-truck drivers, one pick-up truck driver, one supply-room attendant, and the mine clerk. A Galion Model 101 road grader is operated when needed by the dozer operator.

The maintenance shop in the service area near the cleaning plant is equipped to replace major units on trucks and other equipment, but complete overhauls of replacement units are done by an outside company.

One of the notable practices in Saxton's preventive-maintenance program is the provision for keeping equipment engines heated overnight in cold weather. Each truck and the grader is equipped with a Kim Hotstart, which is an electric heating element in the engine's cooling circuit. The devices are furnished by the Kim Hotstart Co.,

Spokane, Wash. (See photo p. 81.)

When the truck or other unit is parked for the night, the Hotstart is plugged into a dropline from a 110-v highline to keep warm water circulating through the engine.

The obvious advantages are quicker starts in the morning and less wear and tear on the engines.

The Saxton Coal Corp. was formed in 1941 at Saxton, Ky., and transferred operations to Indiana in 1951 after completing strip jobs in the Saxton-Jellico area of Tennessee. The large units now in service in Indiana were purchased in 1946-47 and were dismantled in Tennessee and re-erected at the present job.

When the time for the next move arrives, the cleaning plant also will be dismantled and rebuilt at the new site. To facilitate this job, Templeton-Matthews designed the plant so that all units and structural members can be reduced to easily-handled and readily-shipped loads and lengths.



## Lo! The Inspector's Weary Life

An Inspector's life isn't one of ease.  
He does his work on his hands and knees,  
The whistle wakes him at half past four  
And he gets ready for his daily chore.

He goes to the portal still half asleep  
To greet the bosses he's got to meet.  
The bank boss tells him the mine's O. K.,  
That he'd never run it any other way.

The Super comes and he hates like sin  
That he's so busy he can't go in,  
But the mine's all right, the Super knows,  
Because all his bosses are on their toes.

The Inspector goes in and starts to sweat.  
The roof isn't brushed and the roadway's wet,  
Posts in the clearance, dirt in the track,  
And the load he's carrying nearly breaks his back.

He finds loose slate and unsupported brow.  
He writes in his notebook—Boy, and how!  
No fuse for the pump, no guard for the gears,  
And it's been that way for years and years.

He goes on up to the working face.  
He tests for gas and he finds a trace.  
They are two hundred feet ahead of air—  
No dates by firebosses marked in there.

The top is drummy, the posts not set.  
He wonders why the miners aren't all dead yet.  
The wire's not guarded and it's too darn low.  
The trap door's dragging on the rails below.

A shot goes off—it's loud and clear.  
The cable is short and the miners too near.  
The Inspector didn't hear the shout of "Fire!"  
He was vainly searching for a grounding wire.

Now the mantrip is ready at 3:00 p.m.,  
And he rides four miles in six minutes flat.  
His hands are shaking as he gets on top,  
His knees are weak and his nerves are shot.

The Super meets him with a great big grin  
And he calls the score, though he's never been in.  
He seems surprised when the bank boss says,  
"The Inspector's book is marked all red."

The Super raves and the bank boss squirms,  
And they disagree in violent terms.  
Then they both calm down and each agrees  
To straighten things out before the Inspector leaves.

They'll get busy, the Inspector knows,  
And they'll make a big noise before he goes.  
They'll load out gob and they'll clean some track  
And they'll both expect a pat on the back.

The Inspector leaves and he goes on home,  
And he knows his work has been well done.  
Though the bank boss squirmed and the Super raved,  
Some posts were set—maybe lives were saved.

The Inspector's friends are far apart,  
For everyone knows that he has no heart.  
But still when he goes to bed at night,  
He dreams he'll find a mine that's right.

Where the track is clean and the rockdust's on,  
Where the props are set and the gob's all gone.  
And the mine of his dreams will meet his test,  
If the roof's high enough to give his knees a rest.

## The Manager's Lament

An Inspector's life may well be hard,  
As is pointed out by the Inspector's bard.  
But who is there who sheds a tear  
For the mining boss and his engineer?

They work by day and they plan by night  
To keep things safe and the posts set right.  
But they also have another goal—  
They draw their pay for mining coal.

The man who's put his money in  
Is taking it right on the chin.  
He's finding pickings pretty slim.  
Let's also shed a tear for him.

*This touch of the humor that lubricates progress was intercepted in its travels, rounded out with "The Manager's Lament" and sent along by R. L. Stearns Jr., president, Stearns Coal & Lumber Co., Stearns, Ky.*

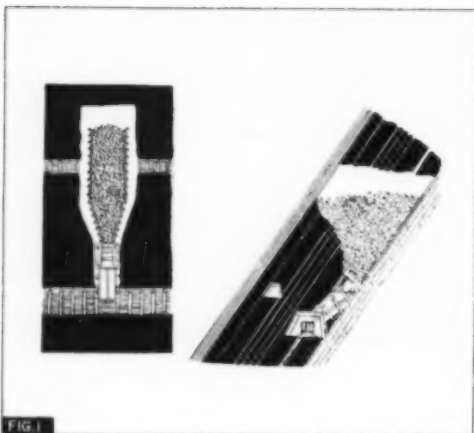


FIG 1

**PIONEER PRINCIPLE** BREAST-AND-PILLAR in its various forms was the early miner's answer to the problem of recovering steeply pitching anthracite at a profit.

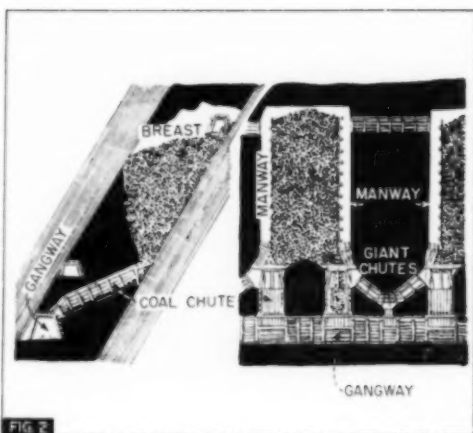


FIG 2

## Pitch Evolution in Anthracite

Breast-and-Pillar—Early Mainstay  
Rock Development—Second Stage  
Slant Mining—Next Step Forward  
Machine Mining—Tomorrow's Method

MACHINES now are being introduced to mechanize—to a degree, at least—the recovery of steeply pitching veins in the anthracite region. The principal type so far is the longhole

drill. Perhaps others will be developed, and perhaps a high degree of mechanical recovery can be expected in the future. However, even though the prospects can be described as at

least fair, hand work supplemented by hand tools and simple machines—drills specifically—will be the rule for a large part of the output for at least a time.

Confronted with a condition—veins pitching so steeply that what might be called normal methods could not be applied—the early anthracite miner apparently arrived rather quickly at the answer to his problem. That answer was to go under and work up. It was equally logical to apply the principles of one of the oldest and

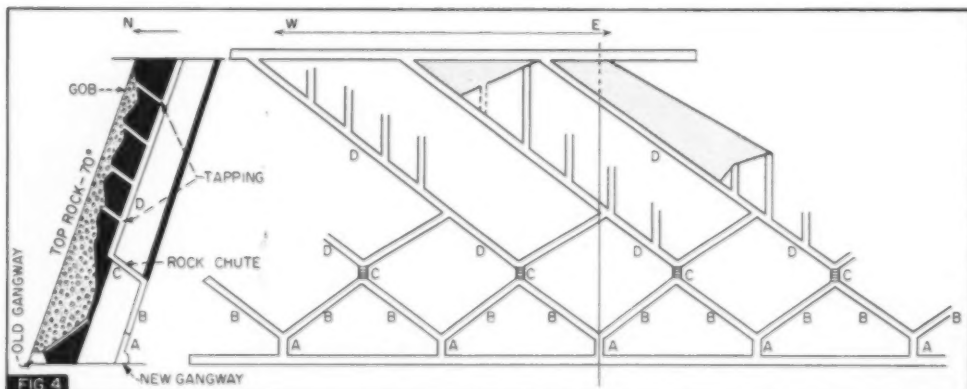


FIG 4

### UNDER-VEIN DEVELOPMENT

USED AROUND 1912 or earlier, this mining plan for pitching coal was based on development in the thin vein beneath, with taps to the main bed.

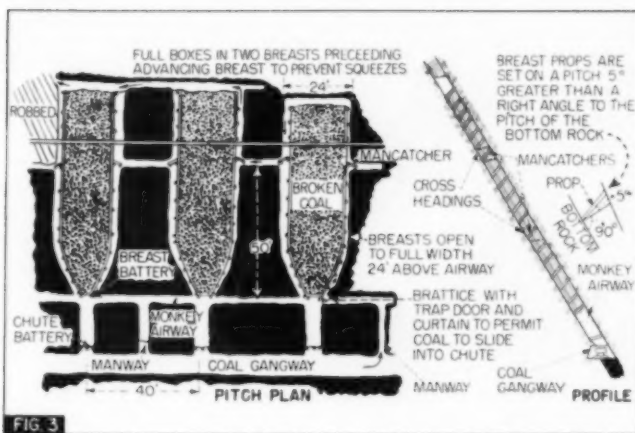


FIG. 3

**MODERN VERSION** DIFFERING ONLY IN DETAILS, this breast-and-pillar plan serves thin veins at a new colliery.

most successful of all mining plans—room-and-pillar. Modified to provide a means of confining and controlling the flow of loose coal down the pitch from the working face, room-and-pillar became breast-and-pillar in anthracite mining.

### Pioneer Plan . . . Breast-and-Pillar

THE ANTHRACITE INDUSTRY probably went to breast-and-pillar almost as soon as it went underground. Because of the basically satisfactory characteristics of breast-and-pillar, it still is the mainstay in steep-pitch production. Other systems have come in, however, and are finding increas-

ing use as means of increasing efficiency in pitch work.

With the statement that they had been "inaugurated many years ago and have been continued with comparatively slight changes," Eli T. Conner, mining engineer, discussing steep-pitch mining in the second issue of *Coal Age* (Oct. 21, 1911), offered a number of steep-pitch plans as prepared by H. H. Stock for the 22d Annual Report of the U. S. Geological Survey. Two of these typical of the breast-and-pillar classification are shown in Figs. 1 and 2.

Breast mining had its drawbacks, however, and still does. One is the sheer physical exertion of climbing to the working face. A second is the

hazard of falling from the face to the bottom of the breast. This led to the installation of mancatchers in the crosscuts or headings, which reduce the possible length of the fall, though it still can be around 60 ft.

Other difficulties in the early days included ventilation, which is still a problem. Blind chutes are a case in point. Driving these and similar openings without positive circulation was, of course, conducive to gas ignitions. To overcome the difficulty, some early mining men hit upon the idea of combining a boy, a sheet-iron fan and wooden tubing. But the boy was the weak link, all too frequently getting tired or going to sleep. Then, if the gas wasn't set off, there was another kind of explosion—this time usually profane in nature.

Consideration of the frailties of the human machine—still a problem, incidentally—led to what was perhaps the first use of electrically powered auxiliary blowers underground. As reported in the February, 1912, issue of *Mines and Minerals*, John M. Humphrey, division superintendent, Lehigh Valley Coal Co., substituted ordinary electric office fans in mines where power was available, with a considerable improvement in results.

Drawbacks or not, the basic advantage of breast-and-pillar made it a good system for pitching as well as flat work. Consequently, it still is widely practiced in the anthracite region. And it has been changed very little in its modern applications, as, for example, at the Germantown colliery of the Raven Run Coal Co. Fig. 3, from the June, 1950, issue of *Coal Age*, shows the plan used at that time in the thinner veins. The gangways are partly in coal and partly in rock,

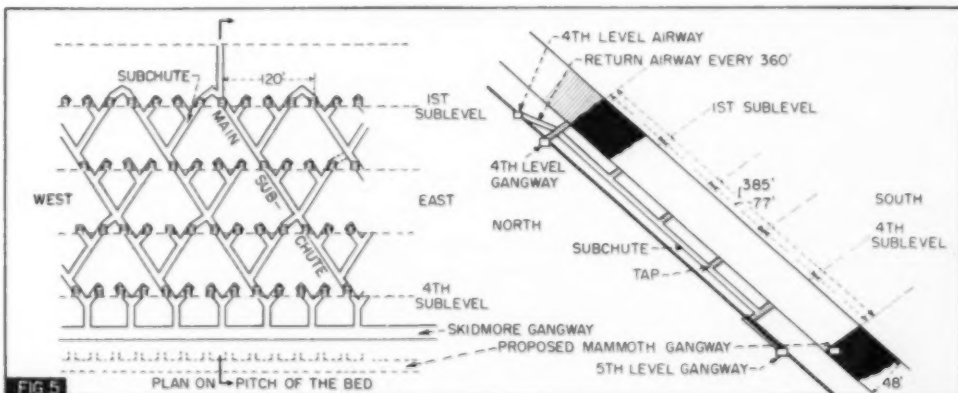


FIG. 5

**MODERN VERSION** IN USE some 25 yr later, this modification of the tapping plan employed subchutes in the rock beneath the main vein to mine the coal in short lifts.



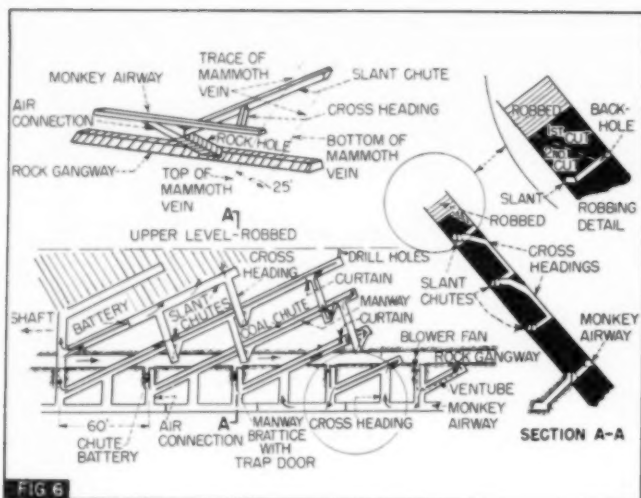


FIG 6

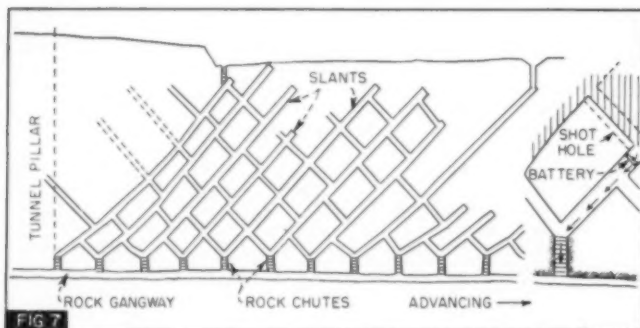


FIG 7

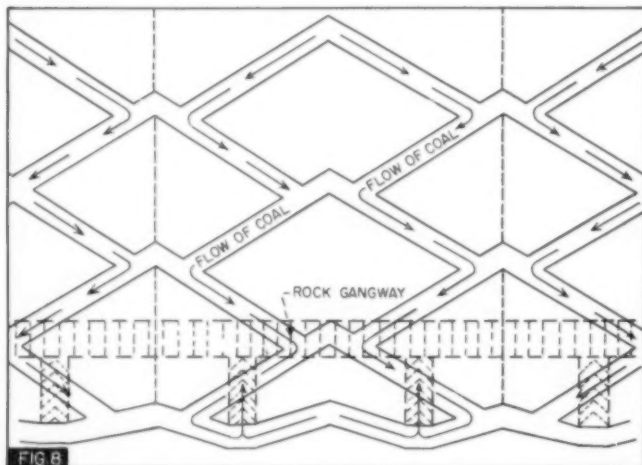


FIG 8

## SLANT MINING

THIRD STAGE in the evolution of pitch mining is illustrated by these slant-mining examples now in service.

and safety is enhanced by mancatchers in the crossheadings between breasts.

## Second Stage . . . Rock Development

EARLY MINING in steeply pitching beds had other and more serious drawbacks than those previously recited. Gangways, for example, were driven in coal. Without the equipment and explosives available today, it was, among other things, rather expensive to put them in rock. Normally, also the number of active breasts on a gangway was limited to one or a very few and consequently gangways had to be kept open for years—deteriorating steadily and becoming more and more expensive to maintain as time went on.

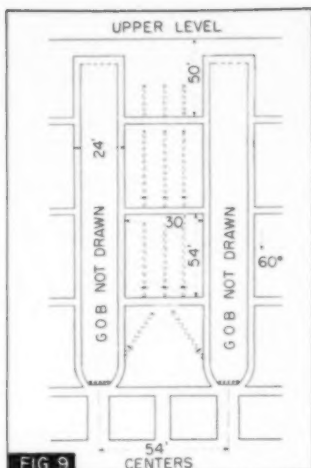
Who made the first break away from development in coal is not now known. Available evidence indicates, however, that the old Short Mountain colliery was among the first to go in for rock development on a major scale, starting in 1912 with the sinking of a shaft to replace drift tunnels in rock from the side of the mountain. These tunnels dated back to the start of operations by the Franklin Coal Co. in 1836, and the fact that they stood up with little maintenance led to a change to rock development with the sinking of the 1912 shaft.

At the time Short Mountain went into rock it also adopted sectionalization or paneling, with separate cross-measure tunnels to divide the level into several working sections. This reduced the life of any particular length of coal gangway and—equally or more important—permitted a major increase in working places and output from a single gangway or working level.

Whether it was initiated by Short Mountain or some other colliery, the practice of developing in rock or in a lower-thinner vein, and sectionalizing gangways began to catch on at an increasing number of collieries around 1912. W. G. Wildin, mining superintendent, Lehigh Navigation Coal Co., Inc., in a paper presented at the Anthracite Section of the American Institute of Mining and Metallurgical Engineers, in July, 1914, stated that sectionalization had been practiced in the Panther Creek Valley area for 5 or 6 yr.

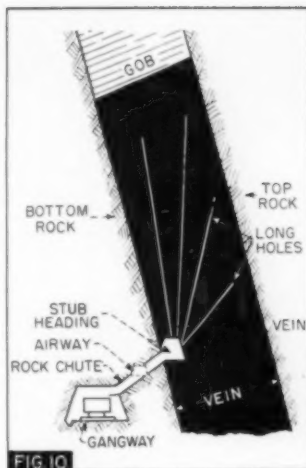
## Third Stage . . . Slant Mining

MINING OF THE MAMMOTH VEIN through rock tunnels from gangways in the underlying Skidmore vein also was discussed at length by Mr. Wildin. He offered a number



**FIG 9**  
**MACHINE RECOVERY**

**THE LONGHOLE DRILL** now leads the list of possible machine methods for recovering steeply pitching anthracite. An early plan is shown left; a modern plan right.



**FIG 10**

of slant-chute plans, indicating that they were coming into regular use at about that time as some of the earlier departures from the original breast-and-pillar method. One, involving taps at regular intervals to recover the Mammoth is shown in Fig. 4. A modification in use in 1938, with sub-chutes in the rock between the Skidmore and Mammoth is shown in Fig. 5. Other modifications include long slants from which regular though shorter breasts are mined in conventional fashion.

What led to the adoption of the slant system? Among the reasons were those presented by Mr. Wildin, as follows:

"The question naturally arises, which is the better of these chute plans? The chute yardage is practically the same in both systems, though a little saving is made by using the long slant chute. The great advantage, however, of this latter method over the use of the box chute lies in the fact that the coal passes through practically its whole course over a light pitch and thus there is much less breakage.

"The only real drop of the coal is in the straight chute immediately at the robbing point. In the other method there is bound to be much breakage in the straight box chutes unless they are kept full at all times, and this requirement, we know, is frequently neglected by the workmen. At best there is bound to be a certain amount of grinding of the coal in the box chutes."

Other advantages have equal or greater weight today. One is a sub-

stantial increase in recovery. Another is easier work. A third is making the best use of the reduced number of miners skilled in steep-pitch production. Also, with the light pitch of the openings, the personal hazard is reduced, the cost of chute repairs is cut, bad bottom or rushes of rock in the open cut can be controlled, and cars per man-day are higher than with conventional mining.

Modern slant-chute systems include the Germantown (Fig. 6); the Newkirk, Philadelphia & Reading Coal & Iron Co. (Fig. 7); and the Knickerbocker, P. & R. (Fig. 8). All these, among other things, feature, as a rule, development from rock gangways or in thin veins below the main vein. Somewhat different from the others and known as the "Diamond," the Knickerbocker plan was adopted in 1945. Among other things, Garfield A. Schnee, division superintendent, in a report presented at a 1950 meeting of the Anthracite Section, AIME,

★ ★ ★ ★ ★

### **Confucius Maybe Said It**

Chip on shoulder perhaps lead to block being knocked off.

He who would leave footprints on sands of time need to wear work shoes.

★ ★ ★ ★ ★

stated that the plan increased recovery 14% over conventional breast-and-pillar.

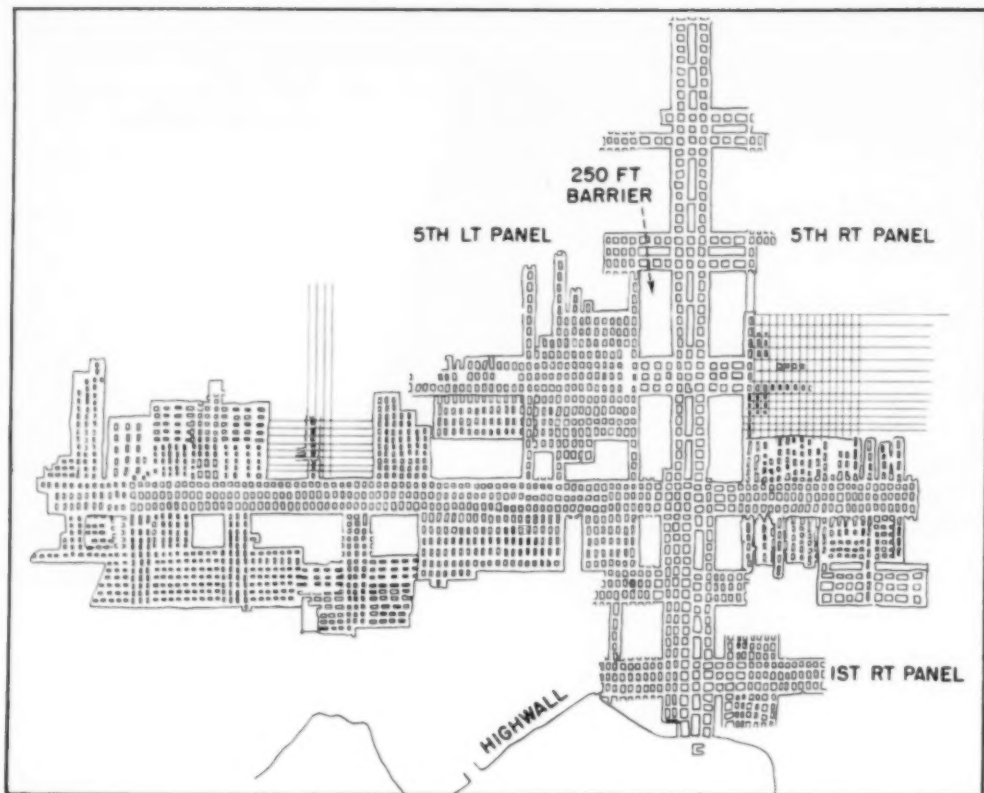
### **Next Step . . . Machine Mining**

STEEPNESS is the designer's greatest handicap when it comes to some type of a production machine for use in heavily pitching coal. The difficulties of handling a heavy piece of equipment where the inclination can go up to 90 deg are manifest. Consequently, thinking has necessarily been along the lines of some small light type of tool that can provide openings by means of which the coal can be broken by explosives and then permitted to run down to the loading point by gravity. However, the big auger or the planer have been suggested as possible methods of recovering pitching coal, and other machines may be developed.

Pending the development of other types of equipment, however, the longhole drill offers perhaps the best possibilities of mechanizing—to a degree, at least—the mining of steeply pitching veins. In fact, it is considered to be a machine offering the possibility of a high degree of remote mining—production with only a minimum of visits to the point where the coal is being mined.

Length of holes in ordinary pillar recovery work has, of course, been increasing. As a result, it is now fairly common practice to drill across or through pillars up to 35 ft in thickness and blast them out in lifts in slant or conventional mining. True longhole drilling, however, was suggested by J. L. G. Weysser, then an instructor at Lehigh University, around 1935. At about the same time—and independently—C. E. Miller, superintendent, embarked on longhole mining at the Westwood colliery. The plan employed is shown in Fig. 9. The drill, according to a report in the August, 1937, issue of *Coal Age*, had put 2-in holes 104 ft up a 74-deg pitch.

Today, the usual practice is to develop for longhole mining from rock gangways. Thereafter, as a rule, a rock chute is driven to the coal and the drilling is done from there. Fig. 10 shows, schematically, one possible method. Various modifications are under investigation, with the work as yet largely experimental. Consequently, the successful plans are yet to be fixed upon, although the evidence indicates that there will be such plans. They include the possibility of drilling from a heading under the vein, thus keeping the miners out of the coal entirely and minimizing development work.



## Timonty Mines Mechanically With AC Power

### Mining Conditions

Sewell seam, 30 to 46 in, lying within 1½% of level. Top is strong blue shale requiring only safety timbering; bottom is hard slate. No gas, little water. Drift operation with portal at 3,200-ft elevation. Cover thickness ranges up to 300 ft.

### Mining Plan

Room-and-pillar, with four-heading main and cross entries and three-heading panel entries. Rooms are driven 40 ft wide on 50-ft centers to a depth of 300 ft.

One Joy loader works in a group of two rooms, each equipped with a chain conveyor feeding to the belt system (30-in belts), to a 2,800-ton bin at the portal. From the bin, an outside belt system takes the coal to the railroad loading point. Two production shifts per day, supply crew on third shift. Average output, 160 men working, 10 tons per man.

### Production Equipment

Eight Sullivan 11 B and eight Sullivan 7 B shortwalls (12 in use).

Eighteen Cincinnati CLU handheld electric coal drills (12 in use).

Seven Joy 12 BU loaders (six in use).

Fourteen Long chain conveyors.

Four Joy chain conveyors.

Three Joy MTB-30 belt conveyors. The outby section of the main-line system is driven by a 40-hp motor on the outside; the underground conveyors are driven by 25-hp motors.

One Joy T-type shortwall truck for transporting cutters and similar equipment.

One Schramm compressor.

Two M-S-A Bantam permissible rockdusters.

### Electrical Equipment

Two General Electric 225-kva mine

power centers, 4,160 to 480/240 v.

Four G.E. 150-kva mine power centers, 480 to 240 v.

Six G.E. distribution boxes, 240 v.

Two G.E. 45-kva mine power centers, 4,160 to 340 v, for belt drives.

### Cable Equipment

One General Electric 1/0 Super-Coronal 4-conductor cable fitted with G.E. plugs and receptacles for 4,160 v.

Other 4-conductor cables as follows:

Size 4/0 for carrying 480 v.

Size No. 1 for 240 v to junction boxes.

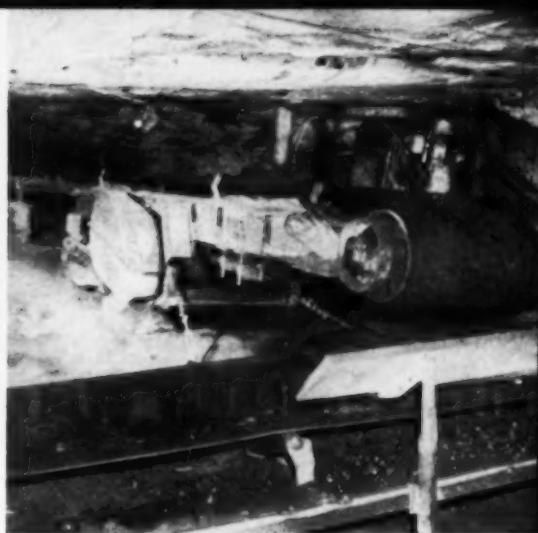
Size No. 2 for 240 v to cutting machines.

Size No. 6 for 240 v to loading machines.

Size No. 6 for 240 v to chain conveyors.



**POWER SOURCE**—One of the Timtony power centers reducing 4,160 v to 480. Cables carry high voltage.



**POWER CONSUMERS** — Panel belt receiving coal from loaders and chains discharging to main belt—all 240 v.

## Three-Voltage AC Ups Efficiency With Safety

To comply with state requirements, Timtony uses 240-v equipment in new conveyor-loader mine.

To make transmission efficient, incoming voltage is 4,160 and intermediate is 480.

To promote safety, grounded neutrals with breakers protect high- and low-voltage circuits.

IN STEP with a coal-industry trend dating back to general acceptance of belts for main haulage, Timtony mine of the Left Fork Fuel Co., Inc., Quinwood, Greenbrier County, W. Va., was designed to operate with AC-powered equipment. Timtony shipped its first coal in January, 1948, and produced 233,000 tons in 1951 from a 30- to 46-in seam with an efficiency of 10 tons per man on the payroll. All equipment was purchased new and includes mine power centers and a power-distribution system designed for supplying good voltage to the face equipment with greater safety than with the conventional 275-v DC systems.

W. E. Sellards, mayor of Lewisburg, W. Va., and president of the company, maintains his office at Quinwood 10 mi from the mine. He oper-

ated mines in Wayne County, West Virginia, for some years, but moved to the Greenbrier field in 1945. Timtony mine was named after his two sons, Tony, now 14, and Timmy, now 10.

Mining is in the Sewell seam and produces a medium-volatile coal very low in ash, low in sulphur and with a heating value above 14,500 Btu. Principal markets are steam and export.

Timtony is a drift mine and the coal lies within 1½% of level and has very few local dips. Elevation of the seam at the portal is 3,200 ft. Cover over the property ranges up to 300 ft. In mining to date the seam has averaged approximately 36 in in thickness. It is free of partings. The top is a very strong blue slate and the bottom a hard slate. No gas has been encountered and such is not likely. Water in-

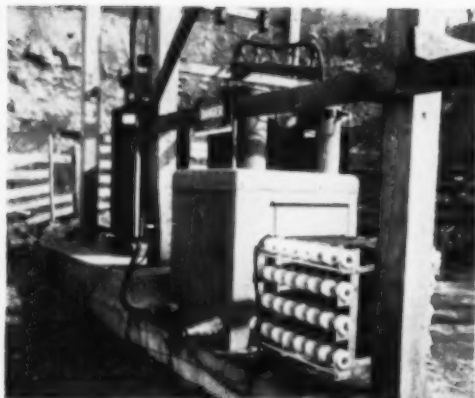
flux is so slight that no pumping has been required in the last 2 yr. The lease of 2,802 acres includes approximately 2,000 acres of coal and affords a remaining life expectancy exceeding 25 yr.

### SAFETY WITH GOOD VOLTAGE GOALS IN TIMTONY PLANNING

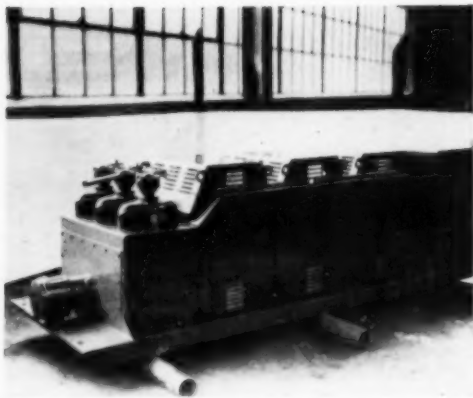
In planning the Timtony electrical system, a voltage of 240 was selected for face equipment in compliance with restriction imposed by the West Virginia Department of Mines. For maximum safety the secondary windings of the transformers supplying this voltage are Y-connected and a ground wire is carried from the neutral, thus limiting the maximum voltage from power conductors to ground to 129. A leakage current of 5 amp or more cuts power from the cable supplying the particular circuit or machine on which the ground has occurred.

To keep the 240-v cables as short as practical without bringing 4,160 v into the section, an intermediate voltage of 480 is used. That 480 v is in cables only; that is, between mine power centers and not to any motors.

Beginning at the outside, the Appalachian Power Co. supplies 13,000 v to a transformer substation owned by the coal company and consisting of three 200-kva General Electric Type HS Spirakore single-phase trans-

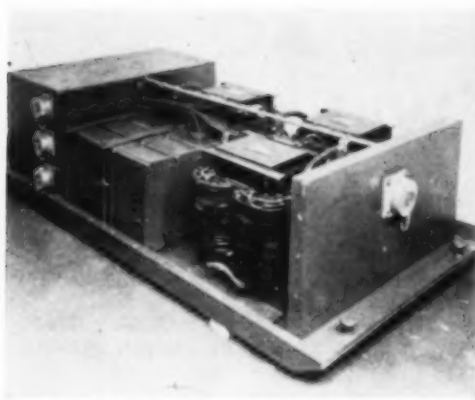


**INCOMING POWER**—three 200-kva transformers, with resistor and grounding equipment in foreground.

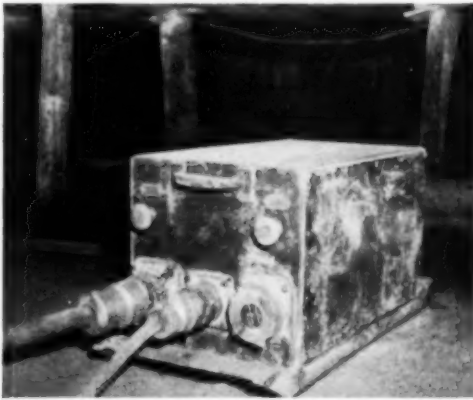


**SKID SUBSTATION**—three 75-kva dry-type transformers and oil-fused cutouts (left); 4,160 to 480/240 v.

## How Timtony uses three-voltage AC effectively



**CAPACITORS** with a rating of 45 kva are included in the equipment for the 150-kva power centers used at Timtony.



**DISTRIBUTION BOX**, 240 v, has two breakers, three feed receptacles and includes ground-trip relays for safety.

formers with 4,160-v Y-connected secondaries.

A grounding resistor between the neutral of the Y and the earth ground, and likewise between the Y and the grounding conductor carried into the mine, limits ground-fault current so that any potential that may appear between the frame of an underground machine and the earth is limited to about 100 v. A current transformer in series with the grounding resistor and operating a relay opens the cable feeder breaker when ground current reaches a certain value.

### POWER CENTERS INSTALLED

Power centers are skid-mounted and the transformers are of the dry type. The 225-kva unit has oil-fuse cutouts on the 4,160-v side to serve as a means

of cutting off power and also to blow in case of a short or severe overload. On the 480/240-v side, consisting of Y-connected double windings, four 225-amp air circuit breakers can supply that number of feeder cables. Height of these 225-kva substations as received was 32 in. In the mine shop one of them was altered to reduce over-all height to 28½ in to work in a low-top area.

The 480- to 240-v power centers, or skids, with a capacity of 150 kva each, and using dry-type transformers, include a 45-kva capacitor on the 480-v side and four air circuit breakers on the 240-v side feeding to that number of Anderson 4-pole receptacles.

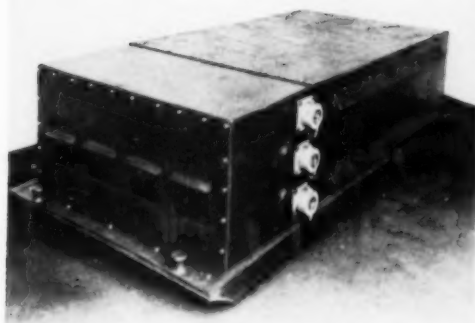
Two of the breakers have 225-amp thermal overload trips (one circuit is

a spare), a third has 125-amp, and the fourth is set still lower. The two breakers with the lower settings feed chain-conveyor heads. As previously mentioned the feeder breakers will trip out if current in the fourth or grounded-neutral conductor reaches 10 amp.

Mine distribution boxes—240-v input and 240-v output, which are advanced with the room—contain two air circuit breakers, one with 225-amp trip for supplying the mining machine and the other with 70-amp trip for the loading machine.

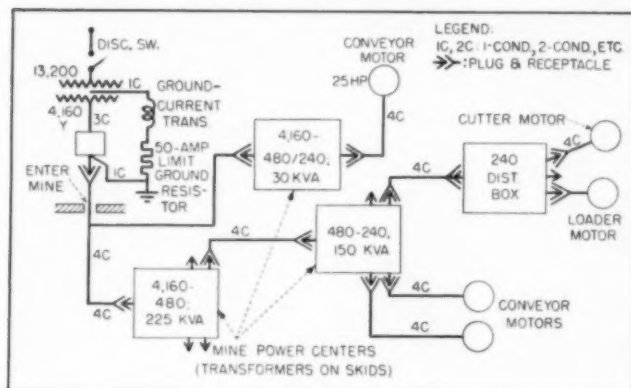
The coal drill is powered through a Miller plug and receptacle on the mining machine. A 5-amp ground in a face machine will trip the breaker in the distribution box. That protection is backed by the outby ground





**POWER CENTER** on the shop floor (left) and in the mine (right). The center is rated at 150 kva, 480 to 240 v. Slide doors provide access to the handles of the 240-v feeder breakers.

## for high efficiency and safety



**TIMONTY POWER SYSTEM** shown schematically in single line, including outside substation, ground protection and equipment served.

trips. Six hundred feet is the maximum distance for 240-v transmission.

As might be expected with a mine powered solely by AC and having no preparation load except a coal crusher, the electrical energy consumption is low. In 1951 the average for the year was 4.98 kw-hr per ton. This year it may be slightly higher because conveyors have been installed to replace trucking of the coal from the portal bin to the railroad.

### CONVEYORS SERVE LOADERS

Rooms 40 ft wide on 50-ft centers are driven 300 ft deep. Multiple shooting is done on shift with du Pont Monobel C. Joy loaders deliver to chain conveyors and normally work two rooms, each of which is equipped with a cutting machine and drill. A

unit crew consists of one Joy operator, one Joy helper, one shotfireman and one panner. The roof is so reliable that only safety posts are required and are set by machine operators.

Four-heading entries are normal for main and cross entries, and the belt conveyors are on No. 2 heading which, on the mains, is second from the right and, on the cross entries, is second from the outby opening. All conveyors are equipped with 30-in belts, and at present the several makes of belting include Goodrich, U. S. Rubber and Manhattan. All belt lines are paral-



There's one thing to be said for ignorance—it sure causes a lot of interesting arguments.

leed with Ensign safety control wires for stopping, starting and locking out from any point.

Outside construction nearing completion provides belt haulage from the portal to the Nicholas, Fayette & Greenbrier Ry., which is operated jointly by the C.&O. and N.Y.C. The belt system replaces a 1.9-mi truck haulage used since the mine was opened.

### BELTS TO RAILROAD

Equipment at the portal consists of a 2,800-ton concrete bin and two Joy plate feeders. The outside conveyors, furnished by Joy and equipped with Goodrich belting, consist of one section 186 ft long, a second 2,155 ft, a third 1,601 ft and the last 650 ft. For this new job, 9,600 ft of 30-in Goodrich rayon belt was purchased. It has a 1/4-in top cover and a 1/8-in bottom cover.

Equipment at the railroad consists of a surge bin and one loading chute. Yard capacity is 23 empties and the same number of loads. Although the mine and portal are in Greenbrier County, the billing point, Timonty, is in Nicholas County. All the coal is crushed at the mine portal before conveying and shipment.

### OUTPUT 10 TONS PER MAN

The mine operates two shifts and a supply crew works on the third shift. There are 160 men on the company payroll and for several months last year the production was over 10 tons per man-shift counting everyone employed.

A contractor has done considerable stripping along the outcrop and now the Left Fork company is about to begin auger mining in the highwall. For this job it has purchased a Me-



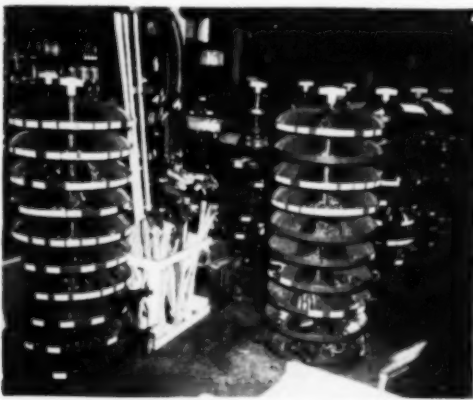
**SHORTWALL** is kept in each place. Coal drill (right) is plugged into receptacle on machine.



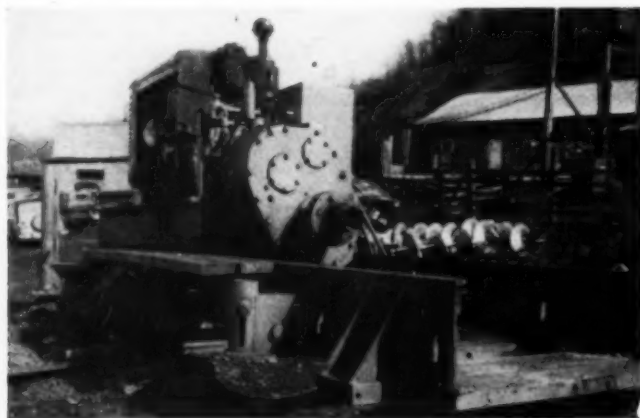
**LOADERS** feed to chain conveyors. Here coal is being moved from crosscut to chain conveyor in center of place.



**MINE VENTILATION** is provided by this 4-ft fan.



**SMALL PARTS** are kept in 12 rotary bins in supply room.



**AUGER MINER** ready to go to work in the highwall at Timtany mine.

Carthy auger miner to bore 30-in holes 70 ft deep.

A one-story cinder block building at the portal has the following rooms: shop, 40x60 ft; supply room, 20x36 ft; waiting room, 10x20 ft; lamproom, 12x20 ft and equipped with 180 MSA Edison lamps; mine office, 10x20 ft; engineer's office, 12x20 ft; and an electrician's room, 10x20 ft. Another cinder block building, 12x16 ft, stores rock dust and a third of the same construction and 10x12 ft is the oil house.

Mine officials include: J. V. Miller, general superintendent; M. C. Hawkins, chief engineer; Floyd Tullis, general mining practice engineer; Walter Lyttle, chief electrician; Dave Bryce, general day foreman; Earl Cadd, general night foreman; and Wilson Kincaid, third-shift general foreman.



TIMTONEY PORTAL with the 30-in main-line conveyor moving coal to the crusher and storage bin. Outside end of the conveyor is mounted on concrete blocks for good support with economy.

## ★★★★★ *Mulvany and the Ruhr* ★★★★★

By Louise Kutchka MacMillan

AN IRISHMAN, not a German, built Germany's great Ruhr coal industry.

For 30 yr William Thomas Mulvany, son of Ireland born in Dublin, guided the growth of Europe's mightiest center of industry, laid out its transportation system and sparked the growth of Duesseldorf, hub of the Ruhr.

William T. Mulvany was the son of Thomas J. Mulvany, eminent artist and keeper of the Royal Hibernian Academy. Young William was educated at Dr. Wall's school in Hume St., Dublin. He took his first step in engineering when he was named to the Irish Boundary Survey.

In 1835, Mulvany surveyed the River Shannon. Seven years later, as Commissioner of Drainage and Inspector of Fisheries for Ireland, he began turning the swamps of his native land into fruitful fields. During the Great Famine, 1846-47, he drafted laws to help the unemployed find jobs. Always, he was energetic, enthusiastic and impetuous, with a knack for doing the right thing under trying circumstances.

Mulvany retired at the age of 46. But he left Ireland almost at once and went to Prussia to take over organization and management of two big collieries owned by an Irish company. This venture was so successful that the collieries were sold to a German concern for twice their cost. Mulvany was elected president of the German company.

Mulvany quickly appraised the

Ruhr's potential. English, Dutch, Belgian and French capitalists had invested heavily in the Ruhr project and their funds backed him in developing the infant coal industry of the Rhineland and Westphalia. But the investors, with some doubts about the success of the enterprise, saw to it that contractors, technicians and administrative officials were German, though under Mulvany's control.

With his new backing, Mulvany started deep shaft mining on a large scale. He chose Hibernia and Shamrock as names for his mines—names that fell strangely on German ears. He selected Duesseldorf as the natural site of his undertaking. Though scarcely any railroad trackage had been laid there, the town was the only large center of population in the district and the navigable Rhine flowed close by.

This accomplished, Mulvany put all the force of his fiery Irish nature, professional skill and experience into the enterprise. The industry grew, but not without crises. He pulled through the industrial crash of 1873, when many new ventures failed, by securing help from the Berliner Handelsgesellschaft and from the firm of S. Bleichroeder, who bought Hibernia and Shamrock for under 5,000,000 *taler*. This made the firm a stock company, fully owned by Germans. Of all foreign investors, only Mulvany and a younger brother remained as directors of the syndicate.

During this depression, the leading men of the Ruhr met in Duesseldorf for the now famous *Kohlentage*, a

conference to discuss cooperation of work and interests. This meeting laid a firm foundation for the mighty coal industry. Several huge combines already had been born—a coal combine in Dortmund in 1858 and a general-industry combine in 1871. Now their collaboration became more complete. Within a few years, coal production rose from 3,000,000 to 20,000,000 tons per year.

"Cheaper and quicker transport" was Mulvany's motto. He sought and shaped the centralization of German transport. With Duesseldorf the center of syndicates, technical associations and business meetings, he planned the railway stations of his adopted city and the bridge that later spanned the Rhine, replacing an old boat bridge. From the outset he denied that railways and canals were competitive and spurred the growth of both. He pushed the building of the Emscher Canal.

On March 17, 1880, Duesseldorf staged a jubilee marking Mulvany's 25 yr of achievement. Deputations waited on him with presentations and addresses. Representatives of all industries entertained him. At a public banquet given in his honor the government representative, von Hagemeyer, said: "To future generations, the name of Mulvany will go down in the history of the Rhenish-Westphalian industry." In fact, Mulvany would have been mayor of Duesseldorf if only he had given up British citizenship.

In his eightieth year, in 1885, Mulvany died, honored and beloved, in his German home.



**TIRE WRECKERS** include improper inflation and pressure drop, causing sidewall breakage, pinching and other damage.

## Water Filling . . . Tire-Saver for TCI



**BEST ANSWER** to loss of pressure and consequent damage was use of sealed caps on inflation nozzles of mining tires.

**EXPERIMENTS** in the use of water-filled pneumatic tires underground at the coal mines of the Tennessee Coal, Iron & R. R. Co., Birmingham, Ala., are proving highly successful in extending tire life and effecting considerable savings in repair costs. In fact, records so far indicate that tire life has been extended at least three to four times, based on shift service, by water filling. As a result of success with water-filled pneumatic tires, TCI has extended their usage to all underground mining equipment and will water-fill all new tires.

**THE USE OF WATER-FILLED TIRES** is the outgrowth of investigations into tire failures, as a result of a more acute condition reflecting the steadily expanding use of mobile mining equipment. It was found that the increase in failures was primarily a result of excessive tire loadings and difficulty in maintaining proper air pressure. This pressure could be controlled, but only with additional equipment and personnel and by constant supervision and pressure tests, both difficult and expensive.

Excessive loading has resulted from a reduction in tire sizes brought about by a reduction in allowable height of equipment. Also, the increased material weights resulting from full-seam mining lead to higher tire loadings in the ever-greater effort to move material at decreasing costs.

Failure to maintain adequate tire pressure reflects the inherent problem of air leakage through the tube walls and valves, together with the difficulties involved in frequent inspections, tire-pressure checks and replacement of lost air.

The TCI study revealed that there were no tire failures from normal wear. In fact, failures occurred long before there was any appreciable wear of treads.

### **PRESSURE THE KEY**

Efforts to determine causes of tire failures and what could be done to prevent them began as early as June, 1949. TCI engineers discussed the tire problem with manufacturers. Several recommendations were made to and received from the various tire builders. Some included self-sealing butyl inner tubes, tamperproof valves, and more-expensive tires of special construction.

All concerned were in agreement that unless tire pressures were kept at recommended values to prevent abnormal flexing of sidewalls, excessive tire failures would occur. Neither solid tires nor zero-pressure tires were recommended for use under bottom and loading conditions existing at the TCI mines.

The idea of completely water-filled tires on mining equipment evolved from a series of meetings and discussions between TCI engineers and representatives of one of the tire manufacturers. Laboratory checks by the man-

ufacturer indicated that water-filled mining tires were feasible. They determined the correct hydrostatic pressure which should be applied to the tires under no-load conditions. Tire stretch, tire loading and no-load pressure were correlated to insure tire operation within the pressure rating of the tire carcass. This was of prime importance because, with water-filled tires, the pressure varies with the load. The manufacturer also developed equipment and processes for completely water-filling tires.

In August, 1949, four rayon and four nylon cord 8.25x15 hard rock lug tires were water-filled and installed on two shuttle cars at Concord mine.

#### MORE SERVICE LIFE

This first experiment showed definite promise of success and shortly thereafter eight repaired used tires were water-filled and put into service. Later eight additional same make 10x15, and eight tires of another manufacturer, were water-filled and placed in service.

Performance of the water-filled shuttle-car tires at the time this article was prepared is shown in the accompanying table.

Although the coal seam at Concord is relatively level and there is a good road bed, tires are subject to possible injury from rocks, iron and other objects which seem to find their way into the haulage areas. Tire injuries from such causes are repaired and the tire returned to service.

The four tires in service in rock work at Hamilton mine have given good service. In driving a rock tunnel the shuttle cars are loaded to about 5 tons.

The repaired tires were ones with former failures and were used as tests. There was no way to measure condition of the tires. It was believed that the pressure to put in a used tire will depend upon its age, type of past service and estimated condition.

In addition to the experimental tires shown in the tabulation, TCI has ordered for service eight each of Manufacturer C 12-ply special service contractor tires; Manufacturer A 14-ply circumferential rib tread tires, and Manufacturer A 16-ply special-service shuttle-car tires.

So far TCI has encountered no serious objections to water-filled tires. Their riding and traction qualities are not objectionable and susceptibility to cuts and bruises is comparable to air-filled tires.

The experimental tires show some tread wear after service over several hundred shifts. With this increase in tire life it is believed that additional problems will be presented. Bead wear and rubber deterioration from grease are likely to be considered now in efforts to further extend tire life.

Tires that have become damaged beyond economical repair for water-filled duty will be used on elevating conveyors, on car retarders, and in other light-duty service. Investigation is under way to determine whether the ability of a repaired water-filled tire to stand up under heavy-duty operations can be predetermined by high-pressure tests.

#### PRESSURE MAINTAINED BETTER

TCI engineers do not say that water is superior to air in tires. But they have found that it is easier to maintain

### How Water-Filled Shuttle-Car Tires Performed

Type of Tire	Shifts Operated	Remarks
Mfr. A: nylon cord, 12-ply, 8.25 x 15	620	In service
	612	In service
	642	Out for repair
	612	In service
Mfr. A: rayon cord, 12-ply, 8.25 x 15	358	Out for repair
	648	Out for repair
	534	In service
	434	Out for repair
Mfr. A: rayon cord, 12-ply, 10 x 15	208	In service
	174	Out for repair
	210	In service
	208	In service
	73	On rock grade
	73	
	73	
	73	
Mfr. A: repaired used tires, 12-ply, 8.25 x 15	65	Failed, not serviceable
	7	
	57	
	171	
	276	In service
	1	
Mfr. B: rayon, 12-ply, 8.25 x 15	186	In service
	253	In service
	67	In service. There are eight of these tires; one was repaired for cut sidewall after 36 shifts.

adequate pressure in tires by using water. In air-filled tires, there is leakage through the sidewalls and the valve. The valve is sealed on the water-filled tires. Stretching of the tire, even when water-filled, is recognized. Repressuring may be necessary to prevent excessive flexing of the sidewalls.

The drop in initial pressure was indicated when tests were made on one nylon and one rayon cord tire in service 551 shifts. The original pressure was 85 psi at no load and dropped to 15 psi for rayon and 28 psi for nylon. With empty shuttle-car load only, the pressure in the rayon tire dropped to 38 psi and in the nylon tire to 57 psi.

TCI engineers estimate that the initial pressure should be about 110 psi for a 100-psi tire. This pressure might be an advantage to pre-stretch the tire, after which it could be repressured to 100 psi. Then, after long use, if the tire shows too much flexing, it could be repressured to 75 to 80 psi.

As yet there has been no experience in retreading. However, it is felt that with the longer life expectancy of water-filled tires, retreading will be considered.

TCI engineers express the opinion that it would be possible to obtain the same results with air as with water provided all equipment was repressured each shift, and if the air could be maintained in the tires at 100 psi. However, this procedure, requiring special air compressor equipment, is costly in coal mines. It would be expensive to either take the compressor to the mining equipment or the equipment to the central, or strategically located, compressor.

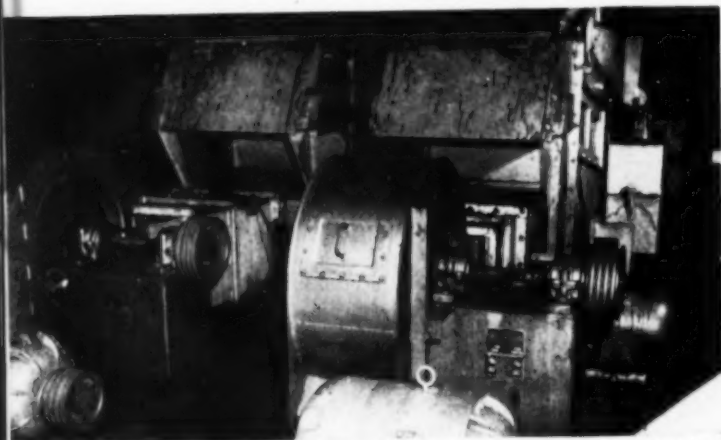




**FOR A BETTER PRODUCT**, new washery was built at left and new air cleaners in the rear, with raw screening and crushing in old tippie at right.



**HEAVY-DENSITY CONE** cleans  $7 \times \frac{1}{4}$  in new Tams washery. Clean coal leaves at the left. Control board appears in the background over top of cone.



**FOUR AIR CLEANERS** are installed in the old tippie to clean  $\frac{1}{4} \times 0$ . Two shown in photo and the other two are behind them. Blower motors are 25-hp.

## Rebuilding

**How the Tams plant was modernized for high efficiency now and in the future to back up a precision mining plan.**

COMPLETION of a heavy-density washing plant has enabled the Gulf Smokeless Coal Co., Tams, W. Va., to eliminate hand picking of its Pocahontas No. 4 coal, and at the same time build for the future with a system able to handle the difficult job of cleaning Pocahontas No. 3 coal when that seam is opened.

Changes in the existing tippie included installation of four Stump Air-Flow coal cleaners, to upgrade the slack. Disposal of refuse from the wet and dry plants, and also mine rock, has been solved for the next 40 yr by a new Interstate aerial tram  $\frac{3}{4}$  mi long which elevates the material over a 700-ft ridge and dumps in the next valley. Only a very brief adjustment period was required to bring the washing plant to a high efficiency.

Tams is in the Winding Gulf field in Raleigh County, West Virginia, 12 mi southwest of Beckley. The company was organized in 1908 and last year produced 453,000 tons. W. P. Tams Jr., president since 1911, is a graduate engineer (Virginia Polytechnic Institute). He resides at Tams and over the years has doubled most of the time as chief engineer and manager. The mine map reflects this engineering management, long-term planning and consistent policy.

Full-seam mining is the practice and the principal impurity to be eliminated at the preparation plant consists of a 4-in band of brown slate occurring near the center of the seam. The top is a strong sandy shale. Cutting is done above a  $\frac{1}{2}$ -in bone 2 in from the bottom. Thickness of the coal recovered is about 36 in.

The mine (No. 2) was opened in 1941 with a wooden tippie equipped with Menzies units to wash the  $3 \times \frac{1}{4}$ . When 2,000 tons was being produced on two loading shifts and one tippie shift it was necessary to have 12 men hand-picking plus 3-in coal. Remaining life of No. 2, which started with 2,850 acres of coal, is approximately 15 yr, and it will take about 25 yr after that to mine the No. 3 seam, thus giving the plant a remaining useful life of 40 yr.

# for Long-Term Cleaning Results

## MODERNIZING SCHEDULE

Modernizing the plant was done in two steps. The first called for discarding the 3x1 1/4-in washers in the old tippie, installing a crusher in the old tippie to reduce the raw lump to 7 in, and erecting a new plant to wash the 7x 1/4. The second step called for air tables in the old building to clean 1/4x0, installation of which was completed May 12 after this article was written.

Space for the new crusher was found under the existing main shaker. This crusher, built by McLanahan & Stone, is a Super-Black Diamond 24x30-in single-roll unit.

Fairmont Machinery designed and built the new washing plant including belt conveyors bringing the raw coal from the old plant, a refuse bin at the aerial-tram terminal, and belt conveyors carrying mine rock and plant refuse to this bin. The new structures are of steel with floors of concrete and the spacing from the old wooden tippie is sufficient to minimize damage in case of fire.

As the 7x 1/4 raw coal arrives in the new plant it is freed of tramp iron by a Dings electromagnet at the discharge of an elevating belt conveyor. The monorail suspension of this magnet to permit dropping the tramp iron on the concrete floor is described in the Operating Ideas section, p 112.

## WASHING RESULTS

Rated capacity of the 10-ft Chance cone when working at 1.55 gravity on Pocahontas No. 4 coal is 210 tph and there is a possibility it will be able to handle 15-min peaks at a rate of 225 tph. At the time of this writing, when the cone was washing 125 tph, float in the refuse at 1.55 gravity was averaging only about 0.3% and sink in the clean coal approximately 0.25%.

The accompanying table of results of tests during the first 17 days of plant operation shows a high efficiency on the very first day that coal was washed. That efficiency came well within the guarantee. Therefore, there was in reality no adjustment period. Material rejected by the washer is practically all high-gravity gray slate from the parting and this rejection now runs about 22% of the 7x 1/4 raw feed.

At the control center adjacent to the top of the cone, valve-opening indicators made by the Tejax Engineering Co., Providence, R. I., enable the washer operator to note at a glance the adjustments of the flows of circulating water to the four zones around

the cone. Refuse-discharge gates at the bottom of the cone are butterfly-type, air operated, and their automatic timing relays and indicators are located at the control center.

Pumps for the new plant are of Goyne manufacture and are driven by General Electric Tri-Clad KC 440-v motors. The sand pump, 8-in suction, 6-in discharge, rated 1,000 gpm at 525 rpm, is driven by a 25-hp 1,775-rpm motor, and the circulating pump, 8-in suction, 6-in discharge, rated 1,800 gpm at 860 rpm, is driven by a 50-hp 1,150-rpm motor. Practically all other motors in the wet and dry plants are of this same make and type. Goodyear rubber pipes are used for connections to the sand pump.

## DEWATERING AND LOADING

Primary dewatering is handled by a Parrish-type shaker which includes classifying screens. Secondary dewatering of the 1 1/4x 1/4 is done on an Allis-Chalmers 5x16-ft Low-Head vibrator. Refuse is dewatered on an Allis-Chalmers 5x10-ft Ripl-Flo vibrator.

The new plant has two loading booms, one handling 1 1/4x 1/4-in and the other 7x 1/4-in lump. The lump boom can be raised to divert the flow through a crusher. Both booms are handled by Robbins & Meyers hoists. The plant can load onto three tracks of the C. & O. Ry and two tracks of the Virginian Ry. In addition there is a 20-ton truck-loading bin for dispensing 1 1/4x 1/4 domestic coal. Four of the

tracks are equipped with Brownie car-spotting hoists with a rated rope pull of 12,000 lb at 50 fpm.

Bearings totaling 158 in the Fairmont plant are lubricated automatically by a CentrOmatic system installed by the Lincoln Engineering Co. This same system is scheduled to take care of 84 additional bearings on the air-cleaning equipment. The lubricant used is Cazar, Standard Oil Co., and is pumped directly from the shipping barrels into the system by an electric Lubrigun.

Mine rock from the rotary dump is conveyed to the new 350-ton refuse bin by a 36-in belt conveyor 350 ft long. Refuse from the washer arrives on a 26-in belt conveyor 210 ft long.

Roberts & Schaefer handled the design and installation of the second and final step of the plant modernization. This consisted of installation of four 75-tph Stump Air-Flow coal cleaners in the old tippie, a 26-in belt conveyor to bring 1/4x0 from an existing Low-Head screen, an 8x24-in drag conveyor to bring that same size from two existing Ripl-Flow screens, and an 18-in by 292-ft belt conveyor to carry the air-plant refuse to the bin at the aerial tram.

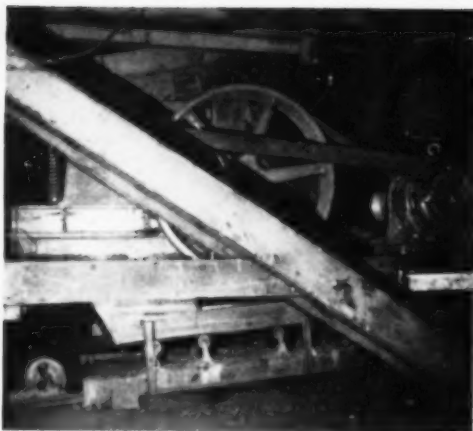
## REFUSE DISPOSAL

The refuse tram, designed and built by the Interstate Equipment Div., Yara Engineering Corp., carries approximately 70 tph from the 350-ton bin to a dumping space back over a ridge about 3,500 ft from the plant.

## Initial Washing Results, Tams Heavy-Density Plant

1951	Sink in Clean Coal @ 1.55								Float in Refuse @ 1.55							
	7x 1/4				1 1/4				7x 1/4							
	No. Tests	High, %	Avg., %	Low, %	No. Tests	High, %	Avg., %	Low, %	No. Tests	High, %	Avg., %	Low, %	No. Tests	High, %	Avg., %	Low, %
5/6	3	0.40	0.27	0.10	2	0.40	0.20	0.00	3	0.80	0.30	0.10	3	0.10	0.07	0.00
5/7	5	1.00	0.54	0.10	3	0.20	0.20	0.20	3	0.10	0.30	0.00	3	0.10	0.07	0.00
5/8	3	1.00	0.47	0.00	3	0.70	0.33	0.10	1	0.30	0.30	0.30	3	0.20	0.13	0.10
5/9	3	0.40	0.14	0.00	4	0.20	0.10	0.00	3	0.20	0.13	0.10	1	0.10	0.10	0.10
5/10	4	0.10	0.08	0.00	2	0.10	0.10	0.10	1	0.10	0.10	0.10	3	0.40	0.23	0.10
5/12	2	0.60	0.20	0.00	3	0.30	0.17	0.10	3	0.40	0.23	0.10	3	0.30	0.23	0.20
5/14	6	0.50	0.20	0.00	5	0.20	0.10	0.00	3	0.30	0.23	0.20	4	1.30	0.87	0.40
5/15	5	0.50	0.25	0.10	2	0.20	0.15	0.10	4	1.30	0.87	0.40	4	1.40	0.45	0.10
5/16	3	0.60	0.30	0.00	1	0.30	0.30	0.30	4	1.40	0.45	0.10	6	1.40	0.80	0.20
5/18	6	1.00	0.51	0.00	3	0.20	0.13	0.10	6	1.40	0.80	0.20	7	1.40	0.77	0.00
5/22	13	0.60	0.18	0.10	8	0.20	0.14	0.10	4	0.80	0.47	0.20	3	0.50	0.30	0.10
5/23	6	0.60	0.30	0.10	6	0.50	0.17	0.10	4	0.80	0.47	0.20	3	0.50	0.30	0.10
5/25	3	0.30	0.20	0.10	3	0.50	0.36	0.10	4	1.80	0.50	0.00	2	0.20	0.10	0.00
5/31	4	0.20	0.10	0.00	2	0.20	0.10	0.00	4	0.20	0.10	0.00	4	0.20	0.10	0.00
6/1	2	0.10	0.05	0.00	2	0.60	0.30	0.00	4	0.20	0.10	0.00	3	0.10	0.03	0.00
6/4	4	0.60	0.20	0.00	4	0.40	0.15	0.00	3	0.10	0.03	0.00				
6/5	3	0.40	0.20	0.10	3	0.40	0.23	0.10								

Washer operating single shift.



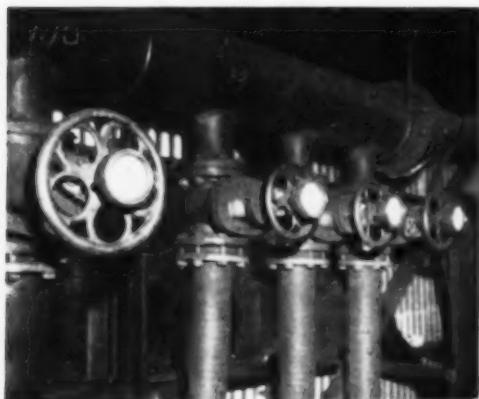
**TO REDUCE LUMP** to 7 in, this 24x30-in crusher was installed in the old plant.



**SUSPENDED MAGNET** removes tramp iron from 7x $\frac{1}{4}$  raw coal.



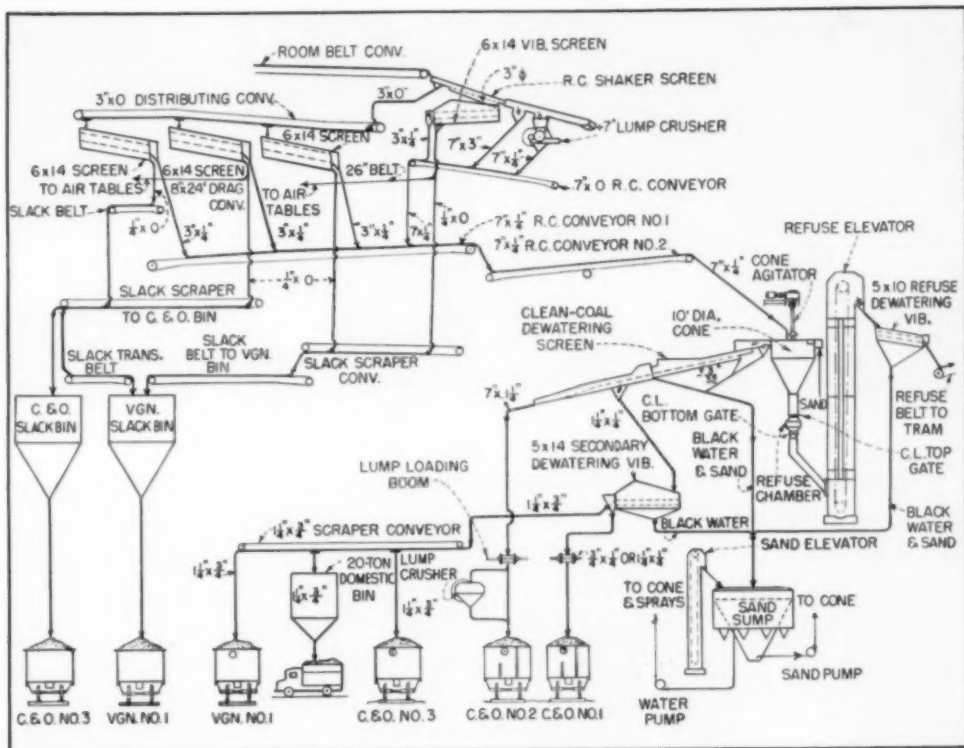
**TWO LOADING BOOMS** (left) serve the new plant. Left boom loads 1 $\frac{1}{4}$ x $\frac{1}{4}$  and the other 7x $\frac{1}{4}$ . The latter can be raised to discharge to a crusher. Three of the four carspotting hoists are shown at the right.



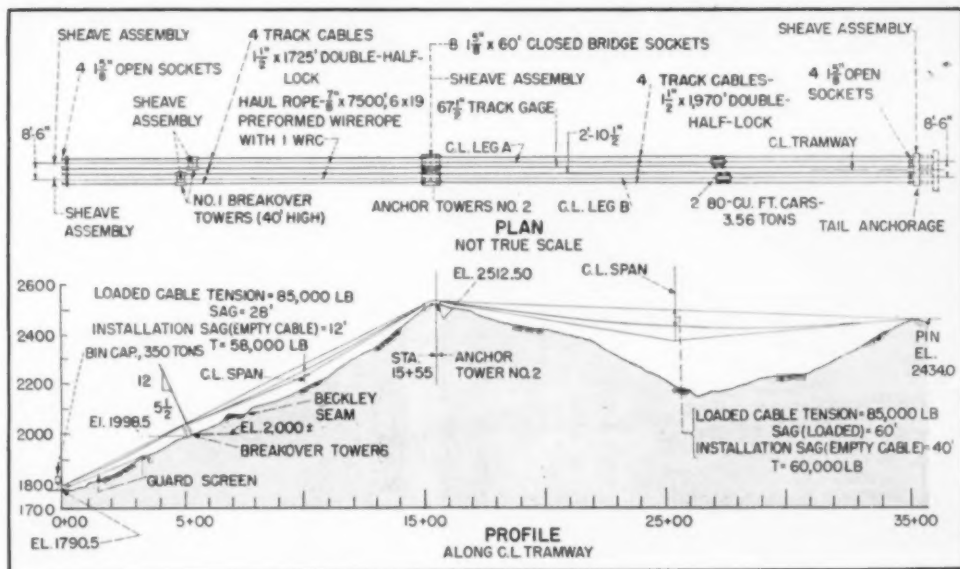
**VALVE-OPENING INDICATORS** check water flow to four zones of heavy-density cone.



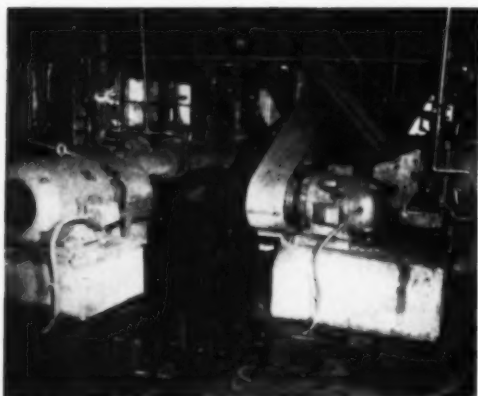
**SECONDARY DEWATERING** of 1 $\frac{1}{4}$ x $\frac{1}{4}$  clean coal is done on 5x16-ft vibrating screen.



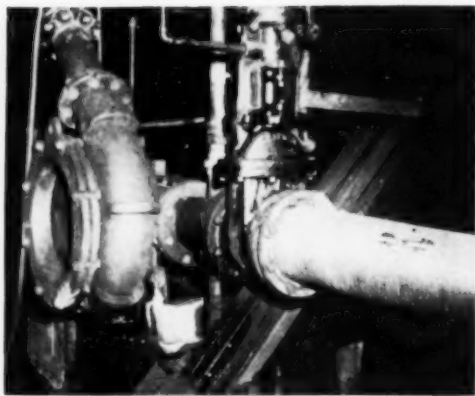
**HOW COAL FLOWS** from raw-coal screens and crusher in old tipple through new Tams washing plant.



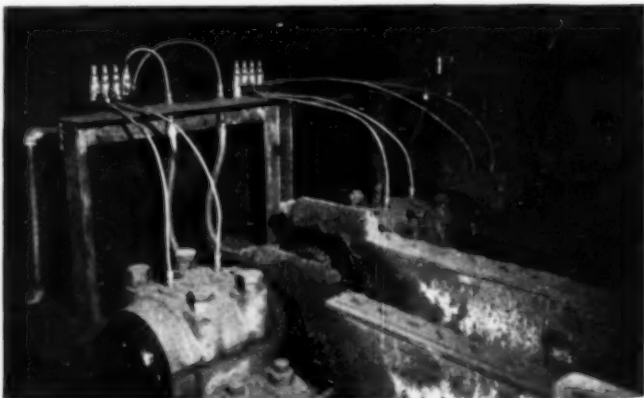
**NEW AERIAL-TRAM LAYOUT** will take care of refuse-disposal for 40 yr.



**CIRCULATING** and sand pumps (left and right) are driven by 50- and 25-hp motors.



**RUBBER-PIPE CONNECTION** from sand pump to sand pump is 10 in in size.



**ELECTRIC PUMP** on original grease-shipping container, with master control, automatically lubricates 158 washing-plant and 84 air-cleaner bearings, including washed-coal screen (right).



**ARROW** indicates where aerial tram crosses ridge 700 ft higher than loading terminal for mine rock and wet-plant refuse.



**DUMPING SPAN** is 1,950 ft, providing space for present mine and future operation in seam below.



Two 80-cu ft buckets (averaging 3.56 tons of refuse) travel at 1,200 fpm. The ridge over which the refuse must be elevated is 700 ft higher than the loading terminal and the angle of rise is approximately 25 deg.

The dumping span is 1,950 ft and on this span the sag in the track cable with empty bucket is 40 ft; and with loaded bucket, 60 ft. The refuse pile can be 200 ft at its greatest height. It is expected that this dumping span will accommodate all the refuse for mining both seams without change of tower locations.

The four track ropes are 1½-in double-half-lock construction made by British Ropes, Ltd., England. Loaded tension per track rope is 85,000 lb. The haul rope, ¾-in diameter by 7,500 ft long, is 6x19U Formset Purple Lang IWRC, made by the Bethlehem Steel Co. Traction is provided by a 96-in grip wheel equipped with air brake and driven by a 200-hp 440-v 880-rpm Allis-Chalmers motor.

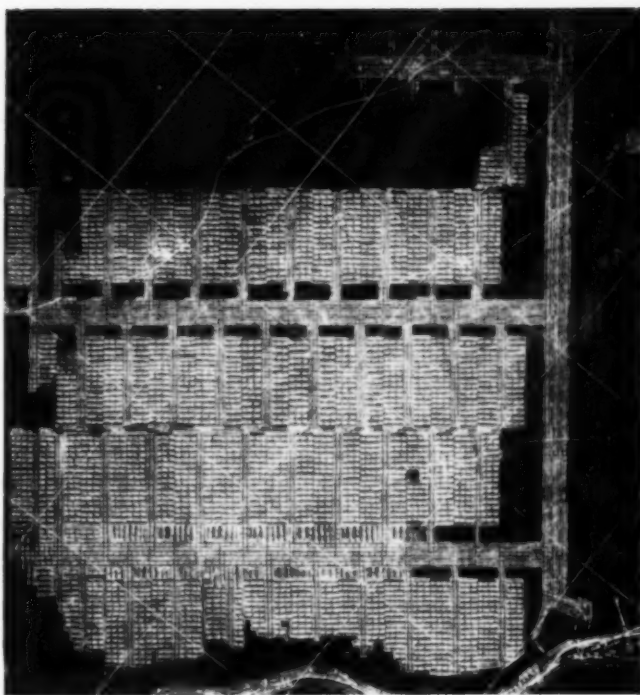
Mr. Tams personally took a hand in designing the foundation for the rope anchorage at the loading terminal. To resist the pull of close to 180 tons he specified a large area on the foundation from corner.

#### MINE DEVELOPMENT

The Pocahontas No. 4 seam, which here lies only about 1% off level but has many local grades up to 5%, is entered by a drift portal at the tippie 10 ft above railroad grade. Of the mine production, 80% is loaded by Joy 14 BU machines (six in use) onto chain conveyors and 20% is hand loaded, also onto chain conveyors. These conveyors discharge to 26-in Jeffrey panel belts with a maximum length of 1,500 ft, and these in turn discharge into mine cars handled entrain by Brownie hoists.

Examination of the mine map definitely shows that the original plan of working has been followed without deviation, that pillars are drawn systematically, and that recovery is high. Working height averages approximately 36 in and reaches 42 in in a few places. As previously mentioned, the brown slate parting, 4 in thick, is loaded with the coal, both in on the hand sections and with the Joy loaders. To repeat, the top is a strong sandy shale.

Six-heading openings with each heading 20 ft wide are driven for the main and cross entries to provide sufficient area without taking top or bottom in the airways. Three feet of bottom is lifted on the track heading to provide 5 ft of clearance over the top of the rail. Gage is 44 in, the rails are 90-lb on the main haulway and 60-lb



OPENED IN 1941 in Pocahontas No. 4 seam, Tams No. 2 mine has reserves of 2,850 acres. No. 3 seam below will provide coal for new mine.

on cross entries, and the ties, 6x8-in by 6 ft, are placed on 2-ft centers. In grading the haulway the bottom rock is loaded into mine cars with a Goodman scraper-type entryloader.

#### PRODUCTION ARRANGEMENTS

Side or cross entries are turned off the main at 3,135-ft intervals and are extended to within 300 ft of the property line. Belt entries, 1,600 ft long and consisting of two headings, are turned off the side entries at 610-ft intervals on one side and the same interval on the other, but staggered instead of being opposite. On one side of the panel the first room crosscuts are close to the room necks and are all in line, so that they form a third heading as the rooms are advanced.

Rooms on 70-ft centers are mined 30 ft wide on the advance. The 40-ft

pillars taken on the retreat usually are worked open-ended. The rooms on one side of the panel are completed and the pillars robbed as the entry is advanced. Face conveyors and room conveyors are Jeffrey chain type. Undercutting to a 7-ft depth is done with Jeffrey shortwalls and shooting with permissible explosive. Belt conveyors are extended every 100 ft, and this requires that the belt lengths be 207 ft.

Double-tracked haulways with crossovers installed midway between staggered room entries—that is, every 610 ft—provide maximum facility for car loading, trip changing and haulage to the outside. Solid-body steel cars, transferred from the company's worked-out mine in the Beckley seam, carry 3.41 tons each and the trips are hauled by 15-ton locomotives. Power at 275-v dc is fed to each belt entry through an I-T-E automatic circuit breaker.

The Pocahontas No. 3 seam, which is to be opened by the time the present mine is exhausted, and which will present a difficult cleaning problem, is 135 ft below the No. 4. Being below water level its mining will present some new problems but the surface plant should need no revisions.

★ ★ ★ ★ ★

MIND—that which, like the parachute, works better when open.

★ ★ ★ ★ ★

# What to Do for Better Ventilation

Compiled to help you get better ventilation at reasonable cost, "Aspects of Coal-Mine Ventilation," a book offering the collected works of Raymond Mancha, a leading ventilation authority, is a practical "How to" manual. Here's a taste of the contents.

## What is the value of a ventilation survey?

Mr. Mancha says, the purpose of an accurate underground pressure survey is to obtain a pressure gradient, thus identifying regions of high resistance and showing where improvement effort should be concentrated.

## How do you make a pressure survey?

You can use either altimeters or inclined manometers. For pressure surveys, altimeters are preferable because you can traverse faster and travel haulageways, rather than through obstructed airways. But for determining friction factors, you may find inclined manometers with rubber-tubing extensions more accurate, and accuracy is paramount in setting up these factors. You can read manometers directly and you won't need to apply correction factors.

## Are velocity surveys worth the effort?

At any particular mine there is a maximum allowable velocity which depends upon local conditions such as power consumption, roof conditions and volume requirements. To locate trouble spots having excessive velocities, use a velometer (velocity-reading anemometer), then take the indicated corrective action, such as cleaning up the air course.

## What is the effect of leaky stoppings?

Mainly this: You have to increase pressure and power requirements to ventilate a particular area with a specified amount of air. For example, if you need 100,000 cfm to ventilate an area, and stopping leakage adds up to 25,000 cfm, you will be required to put 125,000 cfm into the mine. Naturally, you'll need 25% more ventilating pressure to move the 25% increase in volume. Therefore, power requirements will be  $1.25 \times 1.25 = 1.5625$  times the power required if there was no leakage. This illustrates the desirability of maintaining stopping leakage at as low a level as is economically justifiable.

## Where is the best place to split and "unsplit"?

The most effective and economical splitting is accomplished by splitting the intake as close as possible to the place where the air enters the mine and by reuniting the return air currents as close as possible to the place where the air leaves the mine. This procedure permits you to control the air on an individual split, within the limits of the regulator or booster fan, without seriously interfering with ventilation in the remaining splits. In the case of

short splits which start and end well inside the mine, the control of airflow through any one of the splits will affect the remaining splits as a result of the increase or decrease in pressure losses on the intakes and returns outby all the splits, which result from changes in total volume. Furthermore, short splits offer less opportunity for power savings through the replacement of regulators with booster fans.

## Where do you install regulators and booster fans?

The best place for a regulator is at the outby end of the split to maintain the lowest possible pressure differentials across the stoppings in the split. In an exhaust system, where haulage is on intake air, the regulator should be in the return airway. In a pressure system, the reverse is true. Taking full cognizance of local feelings on booster fans, Mr. Mancha comes out for split boosters to reduce power requirements and to lower pressure differentials on stopping outby the booster. But be sure the booster is properly installed.

## How many airways do you need?

If you're projecting new development at an existing mine or opening a new mine, the question arises as to the most economical number of intake and return airways you should drive. If you're wrestling with the problem, Mr. Mancha suggests you use this relationship:

$$N = 9.25 \sqrt[3]{\frac{KQ^2OC}{EA^3wt}}$$

$K$  is the local friction factor (such as  $150 \times 10^{-10}$ );  $Q$  is the volume, in cfm, to be handled by all entries;  $O$  is the perimeter of each air course, in feet;  $C$  is the cost of electrical energy, in cents per kwh;  $E$  is over-all unit efficiency of ventilating equipment from electricity to air, in per cent;  $A$  is the cross-sectional area of each entry, in sq ft;  $w$  is the specific weight of coal, in lb per cu ft;  $t$  is the difference in profit per ton of entry coal compared to room coal, in dollars; and  $a$  is the amortization rate including depreciation and interest on investment, in dollars annually per dollar invested. Solve for  $N$ , round off your numerical answer, and drive that many airways.

## Where do you get more information?

We recommend Mr. Mancha's book, wherein each of these topics is covered more fully. In addition, you'll find in it practical tips on the effectiveness of field airshafts, the optimum size and shape for such openings, air-conditioning for mines, the choice between exhaust or pressure ventilation and how to select, locate and field-test mine fans. And for brethren with a penchant for high-powered math, there are five appendices, some employing the curlicues and convulsions of calculus, on how to make surveys, the effects of stopping leakage on fan performance, the determination of most economical airshaft size and the pros and cons of blowers and tubing in auxiliary ventilation.

**Aspects of Coal-Mine Ventilation**, by Raymond Mancha. Published by Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa. 41 pp. 8½x11-in.; paper. Price, \$1.50. For further notes on books for coal men, see p. 192.

Specify ... **FIRTHITE**  
**MINING TOOLS**  
*"The Famous Blue Bits"*



Specify FIRTHITE "Famous Blue Bits" with assurance that you will get consistently high production. Developed in the world's most modern carbide research laboratory, and manufactured under rigid quality control, FIRTHITE Mining Tools have been used successfully for many years over a wide range of operations. On job after job they have increased tonnage and reduced costs by eliminating roof drilling "bottle-necks," minimizing the "downtime" of mining machines, and providing maximum performance.



**Firth Sterling** INC.  
 MINING DIVISION

3113 Forbes St. • Pittsburgh, Pa.

# Foremen's Forum

## Death Is So Permanent!

**This is a grisly record. But for your own benefit, and for safety tips you can relay to your machine operators, read how simple human lapses contributed to violent death in 23 actual instances.**

IN THE MONTH OF APRIL, 1952, six loading-machine operators and five loading-machine helpers were killed in the nation's bituminous-coal mines. These 11 deaths were 25% of the bituminous total for April. Furthermore, early returns indicate that more deadly haulage accidents will occur in 1952 than in 1951, unless the present trend is checked. From January through April, 1952, shuttlecar deaths accounted for 35% of all haulage fatalities, a proportion roughly three times higher than in any other year.

Such are current trends, as reported in the *Safety Newsletter*, Coal Mining Sec-

tion, National Safety Council, by H. F. Weaver, editor, and D. S. Kingery, chief, haulage section, Coal-Mine-Inspection Branch, USBM. Messrs. Weaver and Kingery also report specifically on the circumstances surrounding the deaths of 23 loading-machine operators, helpers and shuttle-car operators. It is to be hoped that a recital of these 23 truly doleful case histories will provide you with knowledge of hazards that will help you prevent such occurrences in your mine or section. As you read, remember that because of human failures these men are dead—and death is so permanent.

### HOW FIVE LOADING-MACHINE HELPERS WERE KILLED

**1 The victim was crushed between the loading machine and rib when the machine was struck by a shuttle car that got out of control as a result of failure to repair the brake system, which was known to be defective. In fact, the shuttle-car operator had assisted a mechanic in making repairs the day before the accident but the job had not been completed.**

**2 The victim was operating the loading machine (it was customary practice to relieve the regular operator at various times during a shift) when the machine was moved too close to the posts. In backing the machine from the face, the victim's left foot was caught under the right tread, and to effect its release he stopped the right tread causing the machine to swing and squeeze him between the controller casing and a post. The victim was in such a position that he could not reach the safety switch, the tramping-control safety catch had fallen down and his body had the tramping-control lever fouled.**

**3 The victim was pulling the trailing cable ahead of a loading machine that was being moved from one room to the next when he was struck by a fall of roof in the room. Cause of the accident was failure to follow the adopted plan of roof bolting. The roof-bolting machine had broken down and when it was returned to service roof-bolting was started at the face instead of at the last row of bolts, leaving a 16-ft length of unsupported roof. The fall occurred in this unsupported area.**

**4 The victim was caught under the same large fall that killed the loading-machine operator, as described earlier.**

**5 The victim was killed by a fall of roof 22 ft long, 29 ft wide and 5 in thick in an entry. The set of four headings had been driven through an area that had a**

### HOW SIX LOADING-MACHINE OPERATORS WERE KILLED

**1 The victim was standing at the controls of the loading machine waiting for the arrival of a shuttle car, when a coal overhang, 16 ft long 2 ft wide and 7 ft thick, fell from the rib of the crosscut where the shuttle-car roadway was being cleaned. Roof bolts were used to support the roof in this place, but they were not involved in the accident. The cause was attributed to failure to square up the ribs during mining operations which resulted in many dangerous overhanging coal ribs throughout the mine.**

**2 The victim was operating a loading machine at the face of a crosscut when he was killed by a violent outburst of coal which resulted from (1) driving development places toward the core of an overstressed pillar within the abutment zone, (2) failure to maintain a straight, clean break line, (3) failure to make the pillars uniform in size during first development and (4) failure to extract all the coal from pillars in the adjacent worked-out area.**

**3 The victim was shoveling coal from along the rib so it could be picked up by the loading machine. He advanced in the last permanent crossbar, which was 5 ft from the pile of loose coal, and was**

struck by a fall of roof. The company rules prohibit workmen from advancing under unsupported roof, but in this case the rule was not complied with.

**4 The victim was drilling blastholes in a large piece of roof rock that fell on the haulageway; he was standing on the fallen rock when a second fall struck him. The roof above the first fall had been tested and scaled with a tree limb about 18 ft long, and temporary supports had not been set to warn of or prevent the second fall. A foreman had been assigned to supervise the job of cleaning up the fall.**

**5 The victim was struck by a fall of roof while operating a loading machine at a pillar face. The fall resulted from failure to maintain sufficient roof supports in the area where the machine was being operated. The foreman was in the place a few minutes prior to the time the fall occurred, but before leaving to answer a phone call had tested the roof (which sounded drummy) and instructed the operator to keep plenty of timbers close to the loading machine.**

**6 The victim was caught under a fall of roof rock that was 46 ft long, 24 ft wide and 16 in thick. Most of this area, which included a crosscut, was unsupported. The cause of the accident is obvious.**



# B.F. Goodrich



## How coal hauler gets 3,500 hours' service from Universal tires

**T**HE Central Pennsylvania Quarry, Stripping and Construction Company strips anthracite and bituminous coal in Pennsylvania and West Virginia, constructs highways, airports and dams in Pennsylvania, Delaware and New York. Seventy trucks operated by this Hazleton, Pa., firm carry coal and excavation material over rocky mine and construction roads.

The truck pictured above, for example, will be loaded with as much as 30 tons of coal before starting up the steep grade to the dumping platform. Tires take a terrific beating on hauls such as this. Tire costs skyrocket.

Not so with the tires shown. They are B. F. Goodrich tires designed to withstand the strain of rugged coal stripping operations. This company reports its BFG tires with Universal

tread run as many as 3,500 hours of tire-killing service; then can be recapped, good for another 2,000 to 2,500 hours.

One factor in this amazing record is the specially-compounded Universal tread that resists cuts and snags. Husky, wedge-shaped cleats give positive two-way traction, "pull up grades with heavy loads in all kinds of weather," says purchasing agent Harold Stegner.

The nylon shock shield, exclusive B. F. Goodrich development, protects the tire body from shocks and bruises. Strong, elastic nylon cords under the tread rubber stretch together under impact, give you this 4-way saving: (1) more recappable tires and more miles per recap (2) greater average mileage (3) increased bruise resistance (4) less danger of tread separation.

All these savings, yet the nylon shock shield costs nothing extra. It's built into all BFG off-the-road tires of 8 or more plies. Double nylon shock shield in larger sizes.

See the complete line of money-saving B. F. Goodrich tires at your BFG retailer's store. You'll find the address under Tires in the Yellow Pages of your telephone book. *The B.F. Goodrich Company, Akron, Ohio.*





## It'll pay you to go through the rest of this issue for . . .

. . . free catalogs you can use on your job, such as "1,001 shortcuts" for shop work, a 148-p engineering booklet on roller chain, and two booklets on heavy-media coal cleaning, among many others. Be sure to check the two pages facing p 124 and use the postage-free card you'll find there.

. . . the latest equipment available to help you do a better, less costly job—for example, a new-principle aluminum shaking conveyor, a new rubber-tired cutting machine, extra-strong plastic pipe, a safer trolley tap. Briefed for easy reading, this section starts on p 118.

. . . mine-tested "Operating Ideas" that have smoothed out troublesome problems at other properties. Even if your bottlenecks are different, one of these ideas may suggest a possible answer. This regular monthly feature begins on p 112.

. . . news and trends in the industry—what Lewis wants, how coal demand looks for the rest of the year, what the new Ohio AEC plant will do for coal mining. These are only a sampling of the many informative notes you'll find this month. News Index appears on p 127.

roll in the roof. The roll had been taken down in all but the one heading where the fall occurred. Despite the known dangerous condition of the roof in this roll area, it was virtually unsupported. Many of the posts that had been set out by the fall were not capped properly. The seam was 56 in thick but the posts provided were only 46 in long, and the foreman had visited this place about 15 min before the fall occurred.

### HOW 12 SHUTTLE-CAR DEATHS OCCURRED

**1** The victim, a part-time operator making a fill-in trip for the regular operator, struck a crossbar while passing through a check curtain. The crossbar allowed only 3 in overhead clearance and the check curtain obscured the abrupt clearance change.

**2** The victim was killed when he was wedged between the roof and the shuttle-car steering wheel at the discharge point. Adequate overhead clearance was not provided and the shuttle-car was improperly maintained.

**3** The victim evidently was standing up to operate the car and struck his head against a low crossbar or the coal rib.

**4** The victim struck his head while raising to pass through a check curtain. Overhead clearance was abruptly reduced to 11 in, and the abrupt change was concealed by the check curtain.

**5** The victim caught his head between the back rest and a half-header extending into the haulage. Overhead clearance was reduced to 3 in and it is assumed that the victim, who was operating a strange type of shuttle car, turned his head briefly to watch the rear of the car clear some suspended cables.

**6** The victim, a man with no experience around shuttle cars, endeavored to turn a shuttle car around. Although he had many close escapes while maneuvering and his buddy begged him to stop, he persisted until he was killed.

**7** The victim, a man with one day's experience, was killed while maneuvering the shuttle car at an intersection. The victim was 51 yr old, had expressed fear of the shuttle car to fellow workers, and often had been helped out of dangerous situations by the other shuttle-car operators.

**8** The victim turned right into the haulage heading and knocked out a check curtain attached to a 1-in board. He evidently became excited, jumped out of the shuttle-car, and was squeezed between a post and the car.

**9** The victim, a trainee, was returning with an empty shuttle car. He evidently was going too fast, turned the steering wheel in the wrong direction and struck an overhanging coal rib.

**10** The victim missed a turn going into an intersection. Rather than back up and start again, he tried a sharp angle turn and was squeezed against the rib.

**11** The victim, a loading-machine helper, was standing by the loading machine. When the shuttle car approached, the controller stuck and the brakes failed to operate. The car struck the loading machine, causing it to squeeze the victim against the rib.

**12** The victim was killed when his shuttle car was struck by another car barging through an intersection without stopping.

### LENGTHEN THE ODDS IN YOUR FAVOR

Whether your motives are selfish or otherwise, you have a perfect right to work toward the establishment of an enviable safety record in your mine or section. It's the record that counts, since it shows that accidents like the foregoing have been prevented.

But good safety records are not matters of luck. You have to stay one jump ahead of the next accident, and that takes forethought. In thinking ahead and applying definite preventive measures, you will be lengthening the odds in your

favor. And the best way to lengthen the odds in your favor is to apply measures that will prevent accidents even though human failures occur.

In this regard, consider the machinery guards which are placed over exposed gears. If a workman's hand becomes caught in a set of gears, we say a human error was the cause of the injury. He should not have had his hand near the exposed gears or he should have stopped the gears before approaching them. You would think one such accident would present such a striking object lesson that the error would never again occur. But in the days before machinery guards, the error occurred time after time.

Machinery guards, when properly used, provide an answer to the problem because they will prevent the injury even though the human error is committed.

Let's examine the foregoing list of accidents to see if it contains an applicable parallel. Note that four of the shuttle-car operators were killed as a result of striking their heads against objects or getting caught in low clearance. These tragedies were caused by human errors, but the victims alone may not be responsible. The errors may have been committed by bratticemen who built curtains with insufficient clearance, or by machine operators who left overhanging ribs in place, or by bosses who failed to see the potential injuries in these conditions.

As in the machinery-guard example, the solution lies in removing the hazards to prevent injuries even though human failures occur.

Let's set up a hypothetical case to illustrate the point.

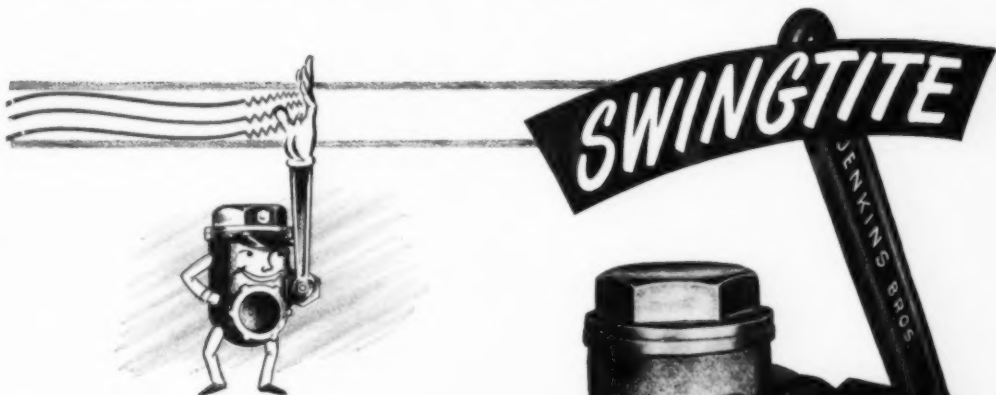
Assume that you are in charge of a mechanized section which includes two shuttle cars. Assume further that three check curtains hang across the shuttle-car routes. If each shuttle car makes 30 round trips per shift, from face to discharge point, your section contains 180 accident possibilities per shift, counting only those approaches from the blind sides of the curtains. And these accident possibilities are of the type that contributed to two of the shuttle-car fatalities. To lengthen the odds in your favor, you will have to eliminate the nailing board behind the check curtain if you can't eliminate the curtain itself. You might even turn the board flat against the roof and bolt it there, if you have to.

Remember, in a coal mine, any one of a host of distractions could claim a shuttle-car operator's attention at the precise moment when he should be thinking of ducking his head to get safely under a nailing board. Subtract from his mental burden by providing him with adequate clearance.

Proceed in the same manner with other types of accidents. Analyze accident reports, try to pinpoint the level at which human failure contributed most to the accident, then search for safeguards that will prevent injuries even though these human failures occur.

That's cold, scientific safety engineering. It will pay off in fewer accidents and higher section morale. If you need a driving motive to spur you on, just remember: Death is so permanent!

# Specify this Fast-action Gate for quick, sure STOP and GO services **JENKINS**



Wherever full, free flow is essential . . . where valve opening and closing must be instantaneous . . . Jenkins SWINGTITE Fast-Action Bronze Gate Valves are setting new standards of performance and endurance.

The exclusive rolling disc and guide track design in the new Jenkins SWINGTITE distributes the wear, assuring maximum tightness (since it prevents uneven wear of seating surfaces), and lengthens valve life.

Use the SWINGTITE wherever fast-action valves take a beating on your processing lines. Compare it for long life and low maintenance. Prove for yourself that day after day it opens freely for full flow, and, closed, it seats tight and stays tight.

Ask your Jenkins Distributor for the folder, Form No. 196, describing the SWINGTITE in detail. Or write: Jenkins Bros., 100 Park Ave., New York 17; Jenkins Bros., Ltd., Montreal.

SOLD THROUGH LEADING INDUSTRIAL DISTRIBUTORS



**BRONZE  
GATE VALVE**

125 lbs. Steam  
200 lbs. O.W.G.  
½" to 2"

## SETTING NEW RECORDS FOR LONG LIFE AND LOW MAINTENANCE IN

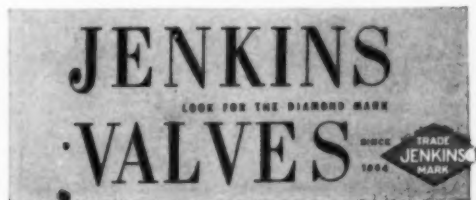
Oil refineries  
Textile finishing plants  
Chemical and food plants  
Pulp and paper mills  
Mines and mineral refining

## AND IN SUCH APPARATUS AS

Laundry machinery  
Dish-washing equipment  
Gasoline and fuel oil lines on motors, burners, etc.  
Fire extinguishing steam lines

## ONLY THE **SWINGTITE** HAS IT— ROLLER ACTION

As the valve is opened or closed, guide rims (A) around the seating surfaces of discs roll freely over guide tracks (B) cast in the body, distributing wear evenly, dislodging foreign matter, and providing a polishing action for seating surfaces. This rolling disc and track construction lengthens valve life and assures maximum tightness.



*Jenkins Bros.*



7 1/2 to 75 1/2 TONS lift capacity... 1 1/2 to 2 1/2 YARDS dipper capacity



## Get all the facts on **"KOEHRING WORK CAPACITY"**

With any shovel or crane, all mechanical features, operating advantages, speeds and capacities add up to one deciding factor . . . cost per yard moved or ton lifted. To make sure you get the biggest profit advantage in excavators and cranes, get all the data on "KOEHRING WORK CAPACITY". For specific facts and figures, see your Koehring distributor soon.

K220

**KOEHRING Company**

MILWAUKEE 16, WISCONSIN

Subsidiaries: Kwik-Mix • Johnson • Parsons





# Operating Ideas



## Tramp Iron Magnet on Mono-Rail Is Easily Unloaded

WITH AN ELECTROMAGNET suspended above the discharge of a belt conveyor there is always the problem of removing the accumulations of tramp iron. W. P. Tams, Jr., president of the Gulf Smokeless Coal Co., Tams, W. Va., solved this by suspending the magnet on a mono-rail trolley and fitting it with handles (foreground, left photo) so that a workman, without exposing himself to danger, can pull the magnet back over the concrete floor and then cut off the

power to drop the tramp iron for convenience in disposal.

The magnet is a Dings High Intensity Type 24RM2 unit, which is of rectangular design and operates on 250 v DC. In position (right photo), it removes tramp iron from the raw 7x4-in coal fed to a Chance cone. Although it was installed primarily for protecting the cone refuse elevator from mechanical damage, the re-use value of the parts collected will pay for the magnet in a short time.



**OPERATING IMPROVEMENT**—This 19-stage, 800-gpm, 125-hp deepwell turbine displaced an underground pump which had its discharge pipe in the nearby 584-ft shaft.

## A 600-Ft Pump Does a Job at Coalwood

WEST VIRGINIA MINES pioneered in the use of deepwell-turbine pumps for mine dewatering, and the state now has some of the deeper—if not the deepest—pumps of that type in the coal industry. One of the very deep installations is a recent improvement at Olga No. 1 mine of the Olga Coal Co., Coalwood, McDowell County, W. Va.

The advantages of having pump motors on the surface where they are easily controlled, inspected and maintained are well known, especially at gassy mines such as Olga No. 1. Since it is automatically controlled, this unit does not require the presence of firebosses or pumpmen.

The new pump, which of course is self-priming, replaced a horizontal split-case centrifugal unit at the shaft bottom, which discharged through a column pipe in the 584-ft-deep shaft. For the new turbine unit, a borehole was drilled 30 ft from the shaft. The pump, made by Peerless, is rated at 800 gpm, has 19 stages and is driven by a 125-hp General Electric motor. The pump's drive shaft is over 600 ft long.





## WITH BATTERY POWER

Smooth flow of coal from face to tippie requires maximum shuttle car flexibility. Battery operated shuttle cars provide unlimited operations in moving coal underground. As independent units without trailing connections, battery cars can run around obstructed passageways, travel alternate routes to and from the loader, travel unusual distances when necessary, and, by permitting one-way travel systems, eliminate passing difficulties and speed up production. All this in addition to safety unequalled with any other type of power!



Gould's Plus-Performance Plan may be able to extend your battery power as much as 50%. It's free. Write Gould Battery Information Headquarters for details.

Gould "Thirty".  
America's Finest  
Mine Shuttle Car Battery

# GOULD

## Industrial Batteries

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries



## Cement Coating Saves Daily Scaling of Roof

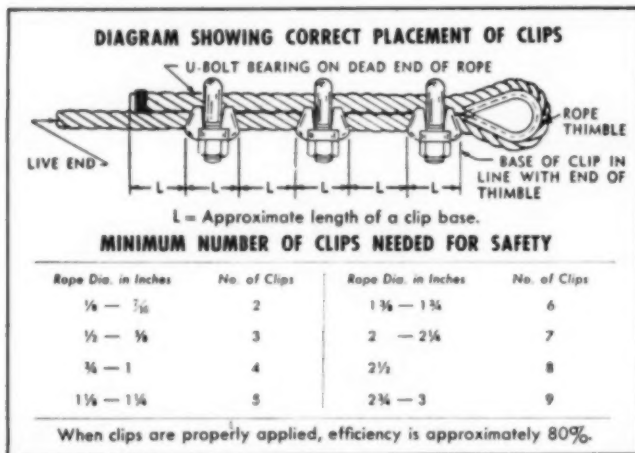
FACED WITH THE PROBLEM of installing permanent protection against spalling roof at the bottom of a new portal and air shaft at Crichton No. 4 mine, in Panther Gulch, Nicholas County, W. Va., the Johnstown Coal & Coke Co., under the direction of A. B. Crichton, Jr., vice president-operations, applied "Gunite." The passageways so treated totaled 795 lin ft, or 23,544 sq ft. Cost of the application, including a thicker and reinforced coating in a battery-charging

room 70 ft. long, also at the shaft bottom, was somewhat under \$1 per square foot.

The gray slate making up the roof is consistently strong and holds up excellently except for the spalling of thin lenticular pieces. Without the permanent protection, scaling would have been required each morning before the men entered during the summer months. Coal thickness (Sewell seam) is 40 in, but enough top is taken around the shaft

bottom to provide an average height of 66 in (left photo). At right, battery-powered shuttle car leaves shaft bottom with a load of supplies.

The average width of the Gunited passageways is 20 ft. The sealing coat consists of  $\frac{3}{4}$  in of Gunite over all areas except the battery-charging room, which is reinforced with standard 4-in mesh steel and has a coating 2-in thick. The work was done by the Allerton Cementing Co., Allerton, Pa.



## How to Apply Wire-Rope Clips Properly

FASTENING WIRE ROPE with clips is such common practice that it's easy to assume everyone follows the basic rules that make for safety, reports *The Yellow Strand*, published by Broderick & Bascom Rope Co., St. Louis 15, Mo. Actually, a newcomer to handling rope who relies on observation of some existing clip applications could easily pick up

bad habits, it points out. It's better for an experienced rigger to acquaint him with the reasoning behind the safety procedure as well as the rules themselves.

As a brief refresher course for all users, the publication outlines the seven most important points to keep in mind when attaching wire-rope clips of the Crosby type shown here:

1. The diameter of the rope determines the minimum number of clips required, per the accompanying table.

2. A thimble in the loop is desirable unless the rope passes around a pin or smoothly rounded anchor of sufficient size.

3. The length of rope turned back as the dead (short) end should be sufficient to provide space between the clips equal to the length of the clip's base (see "L" in the diagram).

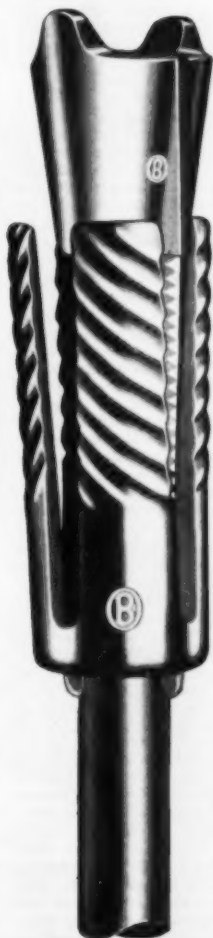
4. Always locate the U-bolt on the dead end of the rope, as shown in the diagram. This seats the broad bearing surface of the saddle on the live rope, without distortion. The fairly common practice of staggering clips is a mistake.

5. Clips are properly installed in a certain sequence. First, attach the one farthest from the thimble, placing it the length of the base from the dead end. Turn this clip up tight. Second, place a light stress on the rope, and then apply the clip nearest the thimble, with the base of the clip in line with the end of the thimble. Additional clips should be equally spaced between the first two. Tighten clips uniformly.

6. After the rope has carried its full load for some time, retighten all clips to compensate for reduction in rope diameter. The periodic wire-rope inspection should include further tightening if needed.

7. Clips should be made of drop-forged steel, and hot-dip galvanized for resistance to rust and corrosion.

# Bolting **MAKES A DIFFERENCE AT LUMAGHI!**



O-B Expansion Shell and Plug for roof support can develop full tensile strength of  $\frac{3}{4}$ -inch diameter roof bolt.

Clean floors from rib to rib in the bolted sections of Lumaghi Coal Company's No. 4 Mine show that *all* the coal shot down in those sections is loaded out - none is lost behind timber props, out of the loaders' reach.

It makes a difference!

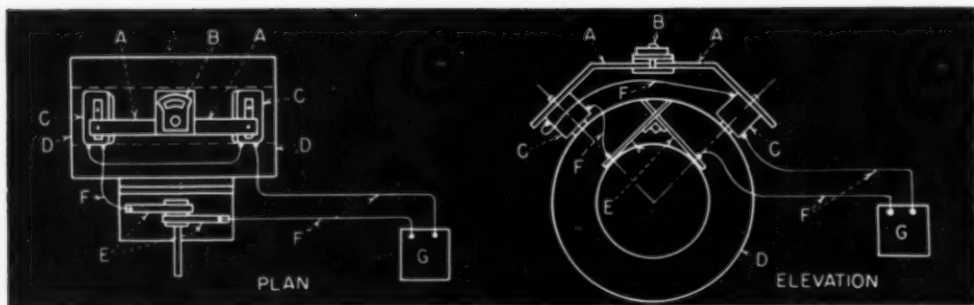
Production from a timbered section at Lumaghi, where 14 places are worked per shift, is equalled by the tonnage taken from only 12  $\frac{1}{2}$  of the places worked per shift in bolted sections. As a result, there is a gain of 400 tons of production each month from the bolted sections.

Two-man crews set an average of 100 48-inch bolts per shift, using O-B Roof Support Expansion Shells and Plugs. One crew has gone as high as 131 bolts set in a seven hour period. Speeds like this are promoted by trouble-free performance of O-B Shells and Plugs!

If you are bolting, or planning to bolt, for increased production, remember O-B Expansion Shells and Plugs. Easy to install - easy to set - they can develop the full strength of a  $\frac{3}{4}$ -inch bolt!

**Ohio Brass**  
MANSFIELD • OHIO

4297-M



## New Invention Quickly Determines Commutating-Field Polarity

L. H. HARRISON, mining electrical engineer, U. S. Bureau of Mines, Birmingham, Ala., reports his newest development for improving mine maintenance—a testing device for determining the correct polarity of the commutating field of a DC motor without reference to the direction of rotation of the assembled motor. Heretofore, the mine electrician was required to know in which direction a motor would run, or he had to assemble the motor and find out, before he could connect the interpoles properly. Mr. Harrison's invention changes all this and, as an added advantage, it provides a method for determining the exact no-load neutral position on the commutator with relation to the commutating field, also before the motor has been assembled.

Here's a three-part description of the invention which Mr. Harrison says should increase dependability of service, reduce costs and conserve materials in DC motor maintenance.

### 1. What the New Tester Is

For determining interpole polarity and no-load neutral, the new tester provides a magnetic path external to the related armature and passing through the coil or coils under test; a means of indicating the value of the magnetic flux flowing in this external path; a set of contacts providing movable electrical contact with the commutator bars of the related armature; suitable connections to provide a continuous electric circuit through the armature and the commutating coils; and a source of power.

Referring to the illustrations, the parts of the tester are identified thus:

A is the magnetic path external to the armature, consisting of a bar of soft iron or steel, solid or laminated.

B is a flux-indicating device.

C is the coil or coils under test.

D is the related armature.

E is the movable contact device.

F is the connecting wiring.

G is the variable power source.

The bar of magnetic material forming the external path is shaped to be adaptable to different diameters of armature cores. Two standard pole pieces are attached to this bar by means of the studs ordinarily used to fasten the pole pieces in the motor frame. One or two commutating coils may be used on either

or both pole pieces. The magnetic bar is separated in the center and fastened together by plates of non-magnetic material to provide an air gap in the magnetic circuit. The moving element of the flux-indicating device, when properly placed in this air gap, will indicate the intensity of the magnetic flux in the bar.

Part 2 of the device consists of electrical contacts mounted on adjustable arms made of insulating material, together with a handle and the necessary conductors for completing the electrical circuit to and from the contact device. The contact arms are mounted 90 deg from each other and are adjustable to permit contact at points 90 deg apart on armatures of different diameters.

### 2. What the Tester Does

The commutating poles in a DC motor eliminate the sparking at the commutator which is caused by the armature coils cutting magnetic lines of force when they are short-circuited by the brushes. They are designed and proportioned to balance the magnetic flux produced in the armature in the neutral space between the field poles, and their polarity should always be the same as that of the armature flux they oppose. If the polarity of an interpole is incorrect, its magnetomotive force is added to the mmf of the armature, and flux in the neutral space is virtually doubled rather than being reduced substantially to zero, as it should be.

The intensive sparking which results from incorrect connection of the commutating field causes heating of the commutator, brushes and armature winding, and leads to burned-out armatures and high maintenance costs. In addition, when such motors are used in gassy or dusty atmospheres, the danger of explosion or fire is greater.

Because heretofore it has been necessary to know the direction of rotation of the armature to determine correct polarity, it has generally been the practice to completely assemble a motor, operate it to determine rotation, then test the polarity of the commutating field in relation to the main field. This often involves considerable time and effort, and is especially true when working with totally enclosed equipment.

The new tester eliminates such time-consuming work while insuring correct motor assembly.

### 3. How the Tester Is Used

The assembled commutating coils, magnetic bar and flux-indicating device are placed on the armature core, as shown.

The contact device is placed on the commutator with one contact approximately halfway between the pole pieces of the test device, and direct or alternating current is passed through the armature. The flux-indicating device then will indicate the value of magnetic flux flowing in the armature and the external magnetic path. If the contacts are rotated forward and backward on the commutator, a maximum flux-intensity will be indicated at one point on the commutator. This will be the exact no-load neutral position with respect to the position of the commutating coils on the armature core. The current then is adjusted to give a reading about halfway up the scale, and the coil or coils under test are connected in series with the armature by means of test connections. If two coils are used they should be connected for opposite polarities.

With the armature and commutating coils connected in series the current again is applied to the test circuit. If the flux indication increases the coils are connected for reverse polarity. However, if the flux indication is reduced substantially to zero, the polarity is correct.

If the first connection indicates incorrect polarity, change the connections between the armature and commutating coils and again energize the test circuit. Correct polarity then will be indicated by reduced flux intensity, which should be zero or nearly zero.

This method also indicates the relative strength of the commutating-field and the armature field. Thus the installation of incorrect or short-circuited coils can be avoided.

Finally, mark the armature at the location of the commutating coils and brushes when correct polarity is indicated, so that the proper relationship may be maintained when the motor is assembled.

# Eaton 2-Speeds cut hauling costs



**E**aton 2-Speed Axles provide a gear ratio for every load and road situation; permit engines to run in the most economical speed range; reduce stress and wear on engines and power transmitting parts. This means lower cost right down the line: through reduced operating and maintenance costs, through faster trips, through longer truck life. And Eaton 2-Speed Axle trucks are worth more on the trade-in.

Let your truck dealer explain how Eaton's exclusive planetary gearing, forced-flow lubricating system, and positive shift control keep trucks on the job without expensive axle repairs.

## EATON *2-Speed Truck* AXLES



*Axle Division*  
**EATON MANUFACTURING COMPANY**  
CLEVELAND, OHIO



Today, America's roads are crowded with twice the traffic they were designed to carry. Help end the national traffic jam by speaking up for more and better roads.





## "Dodge greater lasting power means money to us"

... says **CHARLES BEIL**

of Chas. Beil & Sons, Millstadt, Illinois



"I've tried a lot of trucks but Dodge is my all-time choice. We've never had any trouble with Dodge 'Job-Rated' trucks in our 365-day-a-year schedule of hauling up to 2,000 tons of coal a day. This haul is direct from the coal pit to the user.

"In 23 years in this business, our Dodge 'Job-Rated' trucks have operated at a minimum of cost. The engine stands up with any engine built. We've gotten as much as 125,000 miles without an overhaul. I know from experience that only Dodge gives us this long, low-cost service.

"Dodge greater lasting power means money to us. An out-of-service truck in this business is an expensive proposition."

Mr. Beil's many years of firsthand experience have

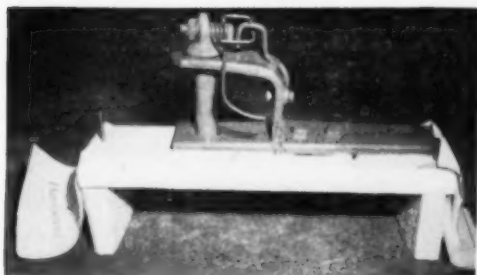
proved to him that Dodge "Job-Rated" trucks fit the job . . . last longer . . . haul maximum payloads . . . save him money.

He knows that because Dodge "Job-Rated" trucks provide the right engine—the right horsepower—for his hauling needs, he can count on years of dependable, trouble-free service. And because of better weight distribution, high rear axle capacity and other important load-moving advantages, Dodge "Job-Rated" trucks handle his rugged hauling jobs easily and more profitably.

There are Dodge "Job-Rated" trucks engineered to fit your specific hauling needs, too. Why not visit your nearby Dodge dealer soon? You'll find him friendly, cordial and full of facts that can save you money in your hauling problems.

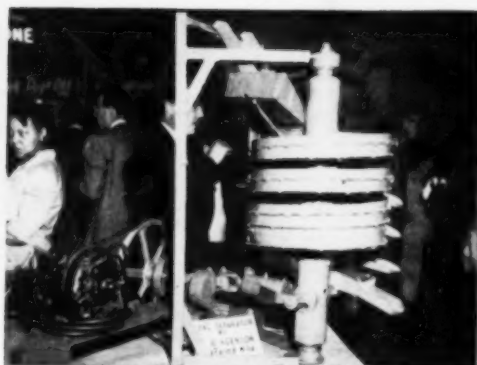
# DODGE "Job-Rated" TRUCKS

## Prize Winners at Bluefield "Gadget Show"



### Safety Hook Holds Coupling Pins in Place

MINE-CAR COUPLING PINS are locked in to prevent bouncing out in transit or dropping out in a rotary dump and are equipped with a handle extending several inches to one side with which they can be picked up for coupling or uncoupling by use of this "Safety Hook for Mine-Car Coupling Pin," developed by Charles Wilson, Roadfork, Ky. The device was one of the entries in the Gadget Contest held at the 1952 Bluefield (W. Va.) Coal Show. Raising the hook handle approximately to vertical with a slight twist frees the loop from the stationary hook attached to the drawbar. When lowering the pin to recouple, the handle of the safety hook can be placed on either the right or left side.



### Coal Separator Features Spiral Design

THIS MODEL of a spiral coal separator took first prize in the Bluefield Gadget Contest for A. W. Herndon, Berwind, W. Va. Downward travel of the coal over the sections of screen cloth and blank plate decks is facilitated by a shaking motion which consists of a rotation back and forth through a small arc. The supporting column has bearings at the top and bottom.



### Radiator Shutters Promise Better Truck Performance

FOR LONG ENGINE LIFE—thus, lower truck-maintenance costs—the temperature of the coolant in both the cylinder head and throughout the lower parts of the cylinder jacket should be as close as possible to the temperature of the lubricating oil. If there is wide di-

vergence between these temperatures, the oil may become sludgy, the oil filter will not work efficiently and cylinder-wall wear increases rapidly.

Such wide variations in temperature from the top to the bottom of an engine are almost certain to occur on very cold

**LET US KNOW** about your good "Operating Idea." **COAL AGE** will gladly pay you \$10 or more for each usable idea, on publication. Write: The Editor, **COAL AGE**, 330 W. 42d St., New York 36.

days—or in warmer weather if the engine operates intermittently under light and heavy loads.

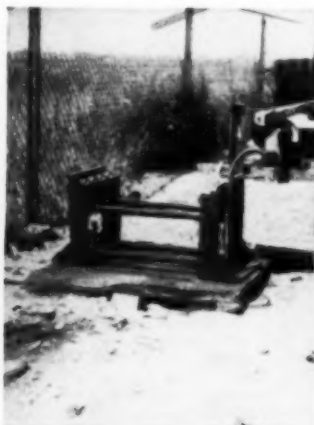
The temperature gage on a truck instrument panel usually shows the temperature of the coolant in the cylinder head or at some other specific place, but the coolant that leaves the engine and flows to the top of the radiator is much warmer than that which is returned to the lower part of the cooling jacket by the pump. It's this difference in temperature that causes sludge and the accompanying plugged piston rings, corroded pistons and so on.

The answer, according to Kysor Heater Co., Cadillac, Mich., is to use radiator shutters to control the flow of cooling air through the engine compartment, rather than a thermostat to control the flow of coolant through the engine and radiator. But be sure the shutter is designed, constructed and calibrated for the type of vehicle on which it is to be used.

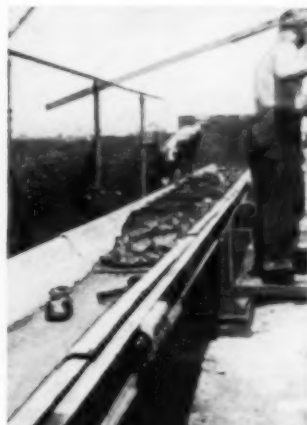
# Equipment News



Motion-transmitting rails



... on ball bearing stands



... shake lightweight pans in

## New-Principle Aluminum Shaking Conveyor (1)

Applying an entirely new design principle in which the shaking motion is transmitted from rails to individual, unconnected pans, the new "Holzworth Aluminum Shaker Conveyor" announced last month by the Frontier Bronze Corp., Niagara Falls, N. Y., is reported to offer important savings in weight and moving time. The conveyor line consists of three parts: the rail transmission sections 18 ft long and weighing about 180 lb; the stands weighing less than 50 lb; and the 6-ft-long pans weighing approximately 60 lb. The pans are inserted, unfastened, into a cradle between the rails through which they receive the shaking action. In making a new set-up, the pans are conveyed forward by the shaking motion and need not be handled manually. Some 108 ft of pan line can be disassembled with 12 bolts.

According to the maker's reports, the total moving-up time of 165 ft of pan line, exclusive of stands and drive, is 29 min, including 4 min for moving ahead that length of pans and 24 min for the rail sections. The unit is the invention of E. Harvey Holzworth, company president, as a result of his experience in a Kentucky coal mine he owns. While first cost is somewhat more than that of the present pan line with stands, pan replacements will cost less than present steel pans, it is pointed out. The entire pan set-up is made primarily from Frontier 40-E aluminum alloy and offers a saving in weight over a steel conveyor of more than 50%, thus permitting the conveying of either larger tonnages or at longer distances, the company says. For full details from the manufacturer, Circle No. 1 on the postage-free card facing p 124.

### Hundreds of Cost-Cutting, Time-Saving Ideas . . . for the Asking

Take a quick run-through of the 56 new equipment items and catalogs described on this and the five following editorial pages.

They are briefed down and the main features highlighted to save you wear and tear in spotting what interests you—new-type equipment that might prove useful at your property and informative catalogs you may find helpful on the job.

The postage-free card facing page 124 will bring more information or the

catalogs offered in any item whose number you circle—without charge or obligation. All you have to do is circle the numbers, sign your name and address and mail.

Every month *Coal Age* culls the manufacturers' announcements, condensing, eliminating and rewriting to bring you a quickly read, effort-saving round-up of new equipment developments and offerings. The postage-free card is an added service we'll be glad to have you take advantage of.

## Hexagonal Shank Bits for Drilling Holes for 2-5/16" Diameter Tubes



Kennametal Hexagonal Shanks in sizes of  $\frac{3}{4}$ " and  $1\frac{1}{2}$ " provide strong bit construction for drilling larger diameter blast holes. They also enable the bits to with-

stand heavier pressure when they are being used on large drills for drilling hard impurities.

## Jack W. Begley is New Kennametal Representative



Jack W. Begley has been recently appointed Kennametal sales representative for southern West Virginia, western Virginia, and eastern Tennessee. Mr. Begley has worked in and around coal mines since the age of 16 and he takes over this assignment  $1\frac{1}{2}$  years after being graduated in mining engineering from the University of Kentucky.

## "First Aid" to Ailing Drill

Whenever you have trouble with drilling or cutting, "just call your Kennametal representative." He's an expert on these matters—and must be. He devotes all his time to them, and is a veteran coal mining man to boot. When one operator in Central West Virginia had a few armatures burn out, he called Jason C. McGuire, our local representative. After giving conditions the once-over, it was obvious that the bits were not being properly reconditioned. They were losing gage, and not allowing sufficient clearance for the auger. The problem was solved in a short time by giving the bit grinding man the proper instructions for the particular drilling conditions that were being encountered down at the face. It was a small, but important matter. But frequently little changes can make an appreciable difference in operating cost. Always depend on your local Kennametal representative for matters like this. He's glad to be of service.

## Web Core Breakers in Coal Drill Bits



A special feature of the large diameter Kennametal Drill Bit is a web core breaker. It extends from the center of the bit to the base of the tip. Being offset, it

breaks up solids through pressure and impact.

(Advertisement)

# AN ENTIRELY NEW ANGLE



# in ROOF DRILLING

Kennametal carbide tip slotted to an angle of 30 degrees increases bit life in hard roof, reduces dust, and enables straighter holes to be drilled.

A new angle in roof drilling is the 30 degree recessed slot now available in improved Kennametal Style HFD Bits. This new feature strengthens the bit, enables it to drill long footage in hard materials. Operators who have used the new design report 30 percent more footage in hard roof, less dust and straighter holes.

This type insert is an exclusive feature of Kennametal HFD Bits that make them the most dependable bit in the field for low cost drilling. Their advanced design, together with the hard shock and wear-resistant Kennametal cutting edge, assures long footage per bit life, lower actual drilling cost, and maximum drilling speed.

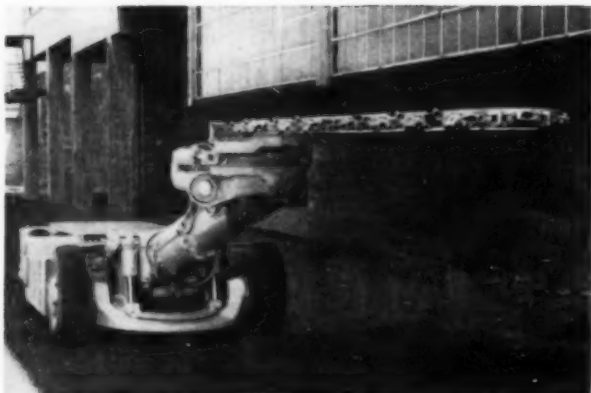
Your local Kennametal representative—who specializes in recommending the best tools for the job at hand—will be glad to demonstrate in your mine. Why not contact him on your next drilling (or cutting) problem? Kennametal Inc., Latrobe, Pa.

# KENNAMETAL



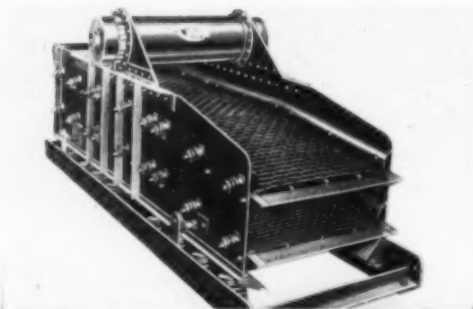
Quality Carbide Of The Coal Industry

*World's Largest Manufacturer of  
Tungsten-Carbide Mining Tools*



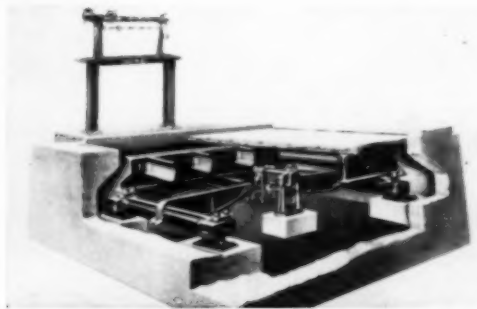
### **New Rubber-Tired Universal Cutter (2)**

Newly designed rubber-tired universal cutting machine recently added to the Goodman line of coal cutters cuts a kerf in any part of the coal seam from top to bottom with no blind spots and makes shear cuts to either side of the machine's centerline, the maker says. Available in standard heights of 34 and 40½ in with a 90-in wheelbase, the unit has a cutter-bar rollover of 185 deg either way from a righthand shearing position. Horizontal swing of cutting element on the lower machine is 45 deg to either side and 40 deg on the higher unit. All operations are hydraulically driven except the cutter-chain drive, and tires larger than normal can be furnished where interchangeability with shuttle-car tires is desired. Full details from Goodman Mfg. Co., Chicago 9.



### **Better Sizing With Scalping Screen (3)**

Greatly increased sizing efficiency and longer headmotion wear life is possible with the new Deister Machine UHS heavy-duty scalping screen with the new Deister lifetime Unitized headmotion, the maker says. Designed for extreme strength, the new screen provides powerful but fully cushioned vibration, automatic screen-cloth tension and Deister's opposed elliptical-throw action, which controls material movement on the screen for greatest sizing speed and efficiency. Data from Deister Machine Co., Ft. Wayne, Ind.



### **Scales for Accurate Axle-Load Weights (4)**

New Howe line of heavy-duty axle load scales designed for accurate axle-load weighing to comply with state laws includes nine standard models with capacities of 15, 20 and 30 tons. Specially built for prolonged hard service and continuous weighing of motor-truck and trailer axle loads, the units feature the Howe three-lever Pipe Lever System and exclusive ball-bearing construction that save wear, prolong accuracy and reduce maintenance. Bulletin 652 from Howe Scale Co., Rutland, Vt.

### **New Belt Conveyor for Heavy-Duty Service in Low Coal (5)**

New Goodman Type 98 is a specially designed belt conveyor that combines the strength and rigidity needed for shuttle-car gathering with a "knockdown" type of construction that facilitates handling in the space limitations of low coal. Available for 30- and 36-in belts with idle rollers of 2½ to 5 in in diameter, the units feature intermediate sections knocked down into easily moved components, the longest of which is a 4-in side channel 8 ft long and weighing only 47 lb. Vertical flexibility of the conveyor line for following rolling bottom is provided by a pivoting action at each joining of the intermediate sections. Another feature is the Goodman prelubricated renewable-seal precision idler bearing. Descriptive catalog from Goodman Mfg. Co., Chicago 9.



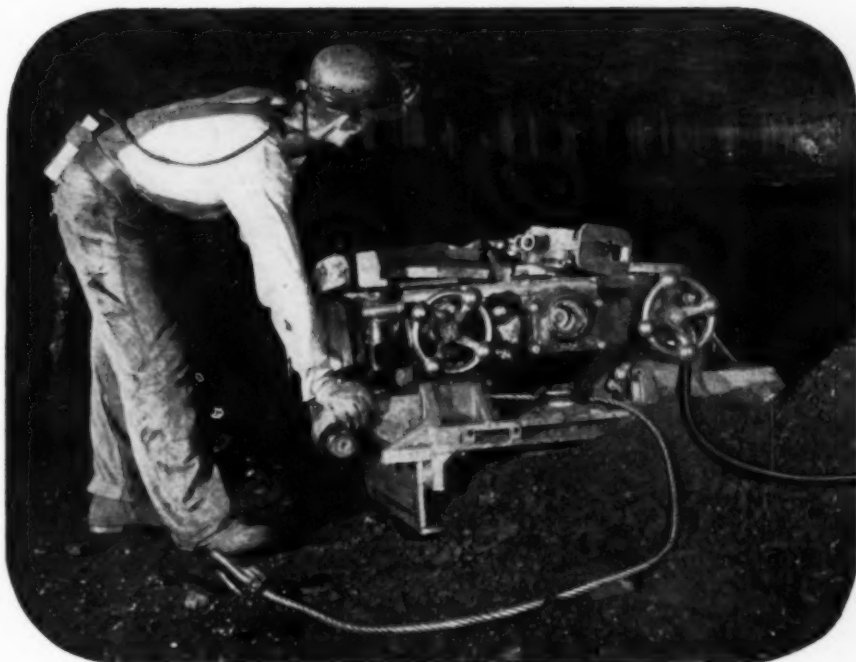
### **Tractor Features Versatile Drilling (6)**

New Schramm Deluxe Pneumafeed, a self-propelled self-powered wagon drill, can drill in an 180-deg arc at any angle up to 6 ft to the rear of the tractor and can drill horizontally to 10 ft above ground level or 3 ft below. In transit, the Pneumafeed fits in front of the rear wheel close to the tractor body to permit free and easy travel. It can be operated with a paving breaker if desired. Bulletin DPF-52 with full data from Schramm, Inc., West Chester, Pa.

***It's easy to get bulletins describing items in this section. Just use the postage-free card facing p 124.***



# MINING MACHINE CABLES



## 3 reasons why you'll save money with Roebling cables

ROEBLING Roeprene Mining Machine Cables are designed and built to stay on the job longer and save money. In the first place, their neutral is made of flat, braided copper which provides maximum elongation and flexibility in every direction. Next, the neutral is covered with braided cotton which cushions and reduces abrasive action between copper and insulation.

And, finally, the Roeprene jackets are "lead-mold" cured so that all components of the cables are held firmly in place. This special curing pro-

duces an extra tough outer covering, too, with top resistance to water, acids, alkalis and grease.

All Roebling Roeprene Mining Machine Cables are approved by the Pennsylvania Bureau of Mines Approval P-111, and comply with the requirements of the U.S. Bureau of Mines for flame-resistant mining cables.

Large quantities of Roebling electrical wires and cables are required in the defense program but we will do our best to meet your requirements. John A. Roebling's Sons Company, Trenton 2, New Jersey.

# ROEBLING

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST &  
S PITTSBURGH ST • CHICAGO, 2525 W. ROOSEVELT RD  
• CINCINNATI, 3253 FREDDONIA AVE • CLEVELAND, 701  
ST. CLAIR AVE, N. E. • DENVER, 4801 JACKSON ST •  
DETROIT, 915 FISHER BLDG • HOUSTON, 2214  
NAVIGATION BLVD • LOS ANGELES, 5340 E.  
HARBOR ST & 120 S. HEWITT ST • NEW YORK, 19  
RECTOR ST • ODessa, TEXAS, 1920 E. 2ND ST  
• PHILADELPHIA, 230 VINE ST • PITTSBURGH  
1301 CLARK BLDG • ROCHESTER, 1 FLINT ST  
• SAN FRANCISCO, 1740 17TH ST •  
SEATTLE, 800 1ST AVE S. • ST. LOUIS,  
3001 BELMAR BLVD • TULSA,  
321 N. CHEYENNE ST •  
EXPORT SALES OFFICE,  
TRENTON 2, NEW JERSEY





#### CABLE FAULTFINDER (7)

Johnson portable set locates faults quickly and accurately in testing various types of cables up to 15 kv, with no calculations, readings, or special detecting devices. Unit produces loud cracking noise at fault point, permitting easy location. Also proof-tests DC motors, transformers and other equipment up to 15 kv. Bulletin from Electrical Distributors Co., Philadelphia 7.



#### FUSED TROLLEY TAP (8)

Dukane No. 570 trolley tap or nip has a ventilated chamber that cannot build up pressure under any circumstances and cannot explode, the maker says. It features large electrical capacity, inexpensive fuse links and strong construction. Details from Duquesne Mine Supply Co., Pittsburgh 9.



#### "ACETYLENE" PISTOL (9)

Handy 12-oz pistol-shaped "Torch-O-Matic" produces acetylene flame at squeeze of the trigger, instantly shuts off on release, saving time and equipment for lighting, adjustment, priming and warm-up, etc. Offered with three combustion tubes up to 3/4 in, unit is specially adapted to wide range of intermittent work or can be locked open. Details from Velocity Power Tool Co., Pittsburgh 8.



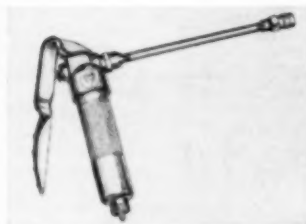
#### CLOSE-COUPLED PUMPS (10)

Aurora Types SAC and JMC include 29 combinations in 3/4-, 1 1/4-, 1 1/2- and 2-in sizes, in capacities from 5 to 150 gpm, heads up to 110 ft and speeds of 3,500 rpm. Packaged as unit for immediate delivery with either three- or single-phase motor or for use with customer's motor. Aurora Pump Co., Aurora, Ill.



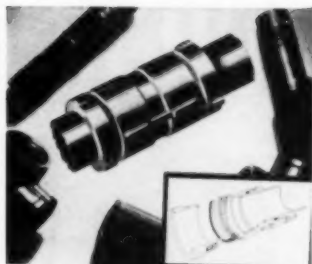
#### PORTABLE GENERATORS (11)

"Speedy-Shift" attachment for Wincharger Models 700, 1500 and 5000 engine-generator sets has a single handle for easy pulling, an advantage for rough terrain, features semi-pneumatic rubber tires, is quickly attached or detached. Bulletin from Wincharger Corp., Sioux City 2, Iowa.



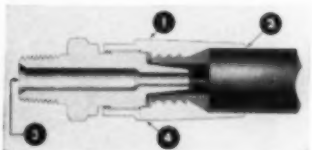
#### HIGH PRESSURE LUBE GUN (12)

Model 1120 one-hand push-action gun weighs only 2 lb but handles all pressure-gun lubricants in any weather with range of pressures up to 10,000 psi. Designed for injection of small amount of lubricant at extremely high pressures, as an auxiliary high-pressure lubricator, and for cracking "frozen" or clogged bearings without need of power gun. Bulletin 681 from Lincoln Engineering Co., St. Louis 20, Mo.



#### EXTRA-STRONG PLASTIC PIPE (13)

Improved Carlon "L" rigid plastic pipe in 1/2- to 2-in sizes features greater tensile and flexural strength, resistance to sunlight and longer life, as well as light weight, easy handling, and resistance to rot and rust. Specially recommended for cross-country piping, land drainage, etc., it is quickly connected with new compression-type coupling of radically different design. Data from Carlon Products Corp., Cleveland 5.



#### REUSABLE HOSE COUPLINGS (14)

New line of "Lok-Tite" couplings reusable over and over again on flexible hose lines features positive grip (1) eliminating dependence on pressure for holding coupling to hose; bell-shaped counter bore of sleeve (2) cutting difficulty in starting hose into coupling; extra-large flow passage in stud (3); and elimination of hose extrusion (4) for safer handling and positive leakproof performance. Lincoln Engineering Co., St. Louis 20, Mo.



#### ALL STEEL PILLOW BLOCKS (15)

New Dodge-Timken line of all-steel pillow blocks offer high radial and thrust capacities and stamina to take heavy shock loads, with minimum dimensions and far less weight. For shaft sizes from 2 15/16 to 10 in, they are shipped ready to install, fully assembled, permanently adjusted, lubricated and sealed at the factory. Details from Dodge Mfg. Co., Mishawaka, Ind.



From an **IMPARTIAL**

viewpoint... the scientist

# Studies the facts!

It requires expert analysis of problems—analysis based on *unbiased* and *impartial* study of facts—to arrive at scientifically-correct results.

Allen & Garcia Company, a professional mine engineering service, is not affiliated with any manufactured product. This assures you of an unprejudiced and penetrating approach to your mining problems.

A & G specially-trained engineers have the experience, and are *scientifically qualified*, to accurately evaluate and efficiently remedy problems for small mines as well as the largest. Preliminary consultation is yours without obligation.

#### SCOPE OF SERVICES

- Design and construction of new plants and their various units.
- Organization, operation and management of mines.
- Below ground modernization and mechanization.
- Reconstruction, revamping, or improvement of existing plants.
- General consulting work regarding power, equipment, operation, and

- various mining problems.
- Valuations for financing, fire loss, taxation purposes—reports and appraisals.

We work with undivided responsibility to you on a cost and fixed fee basis. We are not hampered by any connection which might prejudice the true professional engineering approach to your problem.

## Allen & Garcia Company

CONSULTING AND DESIGNING ENGINEERS

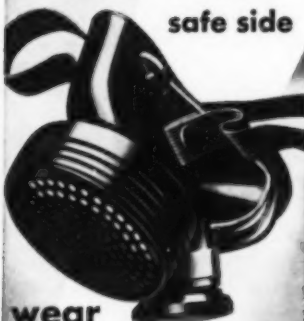
332 SOUTH MICHIGAN AVENUE, CHICAGO 4, ILLINOIS

120 WALL STREET, NEW YORK 6, NEW YORK



**WILLSON**  
dependable  
respiratory protection

keep  
on the  
safe side



wear  
**WILLSON  
RESPIRATORS**

Like these comfortable respirators, all Willson safety equipment is made after careful study of industry's needs. Through this continuing research you get many comfort and safety improvements first in Willson products. Ask for Willson—largest line of respirators for industry, farm and home use.



**Universal  
Gas Mask  
Style WUG**

Approved by U. S. Bureau of Mines for toxic smokes and gases, including carbon monoxide.



**Chemical Cartridge Respirator**

No. 831 Protects against common industrial gases and vapors in low concentration. Bureau of Mines Approval No. 2302.

No. 880 for metal fumes, mists and dusts. Same facepiece as No. 831, with replaceable dust filters. Comfortable under welding helmet. Bureau of Mines Approval No. 2149.

See your Willson distributor or write for bulletin  
**WILLSON PRODUCTS, INC.**  
Washington St., Reading, Pennsylvania

## Equipment Shorts You'll Want to Check

(16) **DOUBLING BOTH AS** a lubricant and preservative, new Texaco oil for internal-combustion engines eliminates need for two separate products for periods preceding or following taking an engine out of service for storage or shipment. Made in two grades, Texaco Preservative Oil 10 and 30 also may be used on stationary and other engines in intermittent service without changing until the end of normal period. Full data from Texas Co., New York, N. Y.

(17) **NEW GRAPHITIC-STEEL PRODUCE** now available from the Steel & Tube Div. of Timken Roller Bearing Co., Canton 6, Ohio, is a turned and bored bar section designed for making ring gages, dies and other annular tool-steel parts. Known as "Graph-Mo Hollow-Bar," the material will be stocked in sizes from 4 to 16 in outside diameter, with a variety of wall thicknesses.

(18) **FOR INDUSTRIAL RADIO MOBILE SYSTEMS**, new desk-mounting Model CSC-60A headquarters FM station operating in the 152-174-mc band combines a 60-w transmitter, a highly selective adjacent-channel receiver, controls and power supply. It can transmit on three frequencies and receive on two, permitting its use to coordinate several different communications systems in a network. Details from Mobile Communications Sec., RCA Victor, Camden, N. J.

(19) **ELECTRICAL TAPES** in new complete line announced by Ideal Industries, Inc., Sycamore, Ill., include a four-coated ravel-free friction tape; a quick-fusing high-dielectric rubber tape; and a two-in-one plastic tape said to provide both excellent insulation and protection against weather and mechanical abuse. Bulletin P-1 gives full details.

(20) **ELECTRICAL CONNECTORS**—Insul-Lock terminal lugs and splicing connectors are made almost entirely of seamless copper tubing to provide high electrical conductivity and maximum electrical and mechanical efficiency. Catalog offered by the F. M. Anthony Co., Piedmont 11, Calif., offers full details on the connectors and installation tools for use with No. 2 to 500,000-cir mil stranded building wire and No. 4 to 4/0 flexible welding cable.

(21) **FLAME-RESISTANT ROOFING** resists combustion even with open flame of 200-deg F and will not alligator during long exposure to sunlight, the maker says. Called "Dasruf," the coating may be applied with brush or spray on damp or dry surfaces, will not sag, flow, alligator or carbonize. Dasco Chemical Co., 1602 Thames St., Baltimore, Md.

(22) **FIRE EXTINGUISHERS**—New Pressurized Model B 1-qt and 2-qt vaporizing-liquid extinguishers announced by the Fyr-Fyter Co., Dayton 1, Ohio, feature fast one-hand-squeeze operation with instant accurate control of a 30-ft

stream. Elimination of pumping or other manual operations makes it easy to aim a direct on-target stream of liquid, it is said.

(23) **FLEXIBLE COUPLINGS**—Cone-Drive standard-bore couplings for Cone-Drive worm shaft, Cone-Drive gear shafts and electric-motor shafts are available in 22 bore sizes from 3/4 to 6 1/2 in and capacities from 4 to 550 hp and are said to permit an average of 3-deg angular misalignment and 1/16-in offset. Larger sizes and a variety of other types also are available from Cone-Drive Gears Div., Michigan Tool Co., Detroit 12.

(24) **WIRING CABLE**—Newly improved General Electric BX armored cable in Sizes 14 to 10 Awg now has, instead of the usual cotton, a glass braid which will not rot, is flameproof and permits a smaller over-all cable diameter. Smaller size of the cable makes it easier to handle and carry, and less work to pull through drill holes. Data from General Electric's Construction Materials Div., Bridgeport 2, Conn.

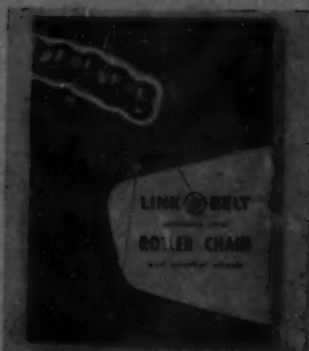
(25) **CREDIT REFERENCES**—With the July issue of the Dun & Bradstreet Reference Book, a 2-yr project of face-lifting the 93-yr-old 4,000-p credit reference has been completed, the publishers say. In addition to being easier to read, the book now uses a new set of symbols that identify all branches of industry precisely, including the producing, wholesale and retail classifications of the coal industry, for example. Information from Dun & Bradstreet, Inc., New York 8.

(26) **ALUMINUM ANTI-RUST PAINT**, known as PCA-102 Aluminum, uses a clear-base vehicle that permits easy and speedy application without the possibility of the base bleeding through as happens with aluminum paints using certain other bases, the maker says. It can be applied by brush or spray right over rust without any preparation. Paint Corp. of America, Cleveland 14.

(27) **POWER CABLE**—General Electric Super Coronol power cable for service up to 8,000 v is now rated at 85-C copper temperature, which is the highest rating for such a cable in this voltage range and means that the cables now are capable of carrying up to 12% more power, continuously, than old-style ozone-resistant rubber-type compounds rated 75 C maximum, the company says. Full data from General Electric's Wire & Cable Dept., Bridgeport 2, Conn.

(28) **ANCHOR BOLTS**—Super-Grip single and double anchor-bolt assemblies for use where anchor or expansion bolts are used are said to give up to 50% more anchorage and can be put in masonry, brick, wood, etc., at any angle and then bent or offset without disturbing the anchorage. Available in sizes from 3/16 to 1/2 in up to 5-in long from Super-Grip Anchor Bolt Co., Philadelphia 2.

## LATEST BULLETINS AVAILABLE VIA FREE CARD BELOW



(30) **ROLLER CHAIN**—New 148-p Engineering Data Book 2457 issued by Link-Belt Co., Chicago 1, is one of the most comprehensive books ever developed on roller chain and its application, the company says. Detailed engineering information covers the selection, installation, lubrication and maintenance of roller chain for drives, conveyors and sprocket wheels. Design notes and selection data serve as a practical textbook on use of roller chain for both power transmission and conveying service. Formulas, charts, diagrams and typical problems simplify selection of the proper chain for any application.

(36) **PUMPS**—In its Catalog 5803, Nagle Pumps, Inc., Chicago Heights, Ill., offers 34 p of detailed information on the design, applications and performance of its line of industrial pumps. Specification tables, detail drawings, installation and operating features will be helpful to men responsible for pump specification and operation.



(31) **"IDEA BOOK"** offered by the Blackhawk Mfg. Co., Milwaukee 1, Wis., is a how-to-do-it picture book every maintenance official and his staff members will find interesting and profitably helpful. Called "1001 Valuable Shortcuts With Hydraulic Tools and Hand Tools," the 64-p booklet illustrates, with very

brief descriptions, how such tools have solved a wide range of production, construction, maintenance and other problems. From one of the many job ideas shown, you might find the solution to a shop or operating problem.

(32) **DIAMOND BITS**—18-p Bulletin 330 offered by Sprague & Henwood, Inc., Scranton, Pa., provides detailed operating and specification information on its line of coring and non-coring bits, casing and casing-shoe bits, reaming shells, diamond-drilling machines and tools.



(33) **COAL CLEANING**—"The Evolution of Coal Cleaning With Dense Media" was prepared by the Nelson L. Davis Co., Chicago 4, to serve as an informative paper for coal men interested in the subject. The 24-p booklet sets forth the various problems encountered and their solutions, all of which when taken into consideration led to the present NELDO dense-media coal-cleaning system, the company says.

(34) **THE FIVE HOSE TYPES** in the new Thermoid "Basic-Five" color-coded multi-purpose industrial hose line that replace 18 former hose types to permit simplification of stocks and reduction of inventories, are covered in a bulletin offered by Thermoid Co., Trenton, N. J.

Details of construction, sizes, lengths, pressures, recommended couplings and uses are given.



(35) **RUBBER-TIRED HAULING TRAILERS** in the line of Athey Products Corp., Chicago 38, are described in a new 4-page, two-color, cartoon-style booklet. Covering the PD-20, PD-10Q and PD-10CP, the booklet has over 15 illustrations and shows two contractors discussing job application and products.

(38) **"NEW HORIZONS IN DRY CLEANING FINE COAL,"** Bulletin 453, has been issued by McNally Pittsburgh Mfg. Corp., Pittsburgh, Kan. The new bulletin describes and illustrates the operation of the McNally Brusset vacuum jig for dry-cleaning fine coal and gives performance data on both field and laboratory installations.

(37) **OVER 500 DIFFERENT TYPES OF WIRE AND CABLE** are covered in the 186-p general catalog published by the electrical wire and cable department of the United States Rubber Co., New York 20. The catalog contains comprehensive data on construction and operating characteristics for such products as control and signal cables, mine cables, wire and cable for the building industry, telephone wire and cable and portable cords, plus a section providing detailed technical engineering data.

### YES—I would like more information . . .

Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled. (September, 1952)

1	5	9	13	17	21	25	29	33	37	41	45	49	53
2	6	10	14	18	22	26	30	34	38	42	46	50	54
3	7	11	15	19	23	27	31	35	39	43	47	51	55
4	8	12	16	20	24	28	32	36	40	44	48	52	56

In addition, please send me data on these OTHER products advertised in this issue (give name and page number) . . .

Name (Print) . . . . . Position . . . . .  
 Company . . . . .  
 Address . . . . .

NOT GOOD if mailed after November 1, 1952

USE THIS CARD



**(33) ALL-STEEL UTILITY BUILDINGS**—Bulletin 1 from United Steel Fabricators, Inc., Worcester, Ohio, shows various styles and applications of the USF prefabricated structures, steps in erection, design and assembly features, together with information on how to plan your own building. Covered is the USF Handy Hut, a small portable-permanent steel utility building.

**(36) ADVANCES IN UNDERGROUND AND PIT MINING**, quarrying and petroleum production through mechanization are described in a 24-p illustrated "Mining Issues" of Production Road, issued by the Twin Disc Clutch Co., Racine, Wis. How productivity has been increased through development of better power equipment, and the part that improved drive links have played in increasing the power, speed and flexibility of machinery are shown—in shovels, cranes, draglines, drills, loaders, haulers, off-highway trucks, continuous miners, tractor-dozers, cleaning and string equipment, belt conveyors, compressors, etc.

**(40) COMPLETE EQUIPMENT LINE** of the Syntron Co., Homer City, Pa., is pictured and briefly described in 56-p pocket-size condensed Catalog 535. Application data, specifications, etc., are provided on the full line of products, including, for example, vibrating feeders, grizzlies and screens, electric vibrators, selenium rectifiers, rock drills and electric power tools.

**(41) REAR-DUMPING 34-TON TRUCKS**, Euclid Models 1FFD and 4FFD, are discussed in a new catalog sheet offered by the Euclid Road Machinery Co., Cleveland 17. Detailed specification data, operating and design features are included.

**(42) "SUGGESTIONS FOR SHOWER-ROOM LAYOUT"**, together with a bulletin describing the use and effectiveness of Onor athlete's-foot preventive, are offered by Onor, Inc., San Francisco 5, Calif. The material contains pointers to be remembered in laying out a shower room and provides a sketch of a typical layout.

**(43) SELENIUM RECTIFIERS**—New catalog sheets available from Richardson-Alloy Corp., College Point, N. Y., provides detailed data on its line of power-conversion units for use with mining equipment, hoists, cranes and other units. Covered also are selenium automatic chargers for industrial batteries.

**(44) IF LABORATORY ANALYSIS OR RESEARCH** is your field, you'll find the 96-p Bulletin 15-14, entitled "Instruments Accelerate Research," of considerable interest. This latest edition has been augmented and brought up to date to include photos and details of the latest instruments and equipment in the laboratory, analytical and measurement fields. From Brown Instruments Div., Minneapolis-Honeywell Co., Philadelphia 44.

**(45) CONVERTIBLE EXCAVATORS**—Three new specification booklets showing detailed information on the new Car Wood 4-yd Models 75A and 75B excavators and the 75BT truck crane are available from Car Wood Industries, Inc., Wayne, Mich. Data includes capacities, ranges, dimensions, speeds, design and operating features on each of the three units.

**(46) MOTOR DRIVES** of  $\frac{1}{2}$  to 7½ hp in its Allspeed line are described in 16-p Bulletin AS-1000-B6 published by Worthington Corp., Harrison, N. J. Covered are both upright and horizontal drives of either closed or skeleton types. The booklet discusses ease of belt change, service, electric motors, torque, base, adverse operating conditions, shaft variations and mounting, and includes selection tables and operation and maintenance data.

**(47, 48) FOTHEADS & TERMINALS**—Sec. 13 of the Anaconda Wire & Cable Co. (New York 4) General Catalog includes complete design data as well as information and instructions helpful for proper ordering and installing all types up to 46 kv, for both outdoor and indoor types and popular designs for transformers and switchgear. The new publication (No. C79-18) may be secured as an individual catalog by

checking No. 47 on the postage-free card. For catalog incorporating Section 13, circle No. 48.

**(49) TRAILER HOISTS AND BODIES** are featured in Bulletin W-105 issued by Car Wood Industries, Inc., Wayne, Mich. Covering both cam-and-roller and telescopic hoists, with advantages of both, the folder discusses the front-mounted telescopic TV35, handling a 30-ton payload; T4430 twin telescopic hoists outside-mounted to by-pass all chassis-interference problems; the F5C cam-and-roller hoist handling 15 tons on a 16-ft body; and the Model F77C cam-and-roller with a maximum payload of 25 tons on an 18-ft body.

**(50) FLEXIBLE COUPLING**—Bulletin 2300 released by the DeLaval Steam Turbine Co., Trenton 2, N. J., provides data on the DeLaval Crown flexible coupling, with complete information on construction, horsepower ratings, speeds, applications and selection.

**(51) PIPE FITTINGS**—Bulletin 585 from the Naylor Pipe Co., Chicago 19, includes specification and prints on standard fittings for lightweight pipe, with illustrations of special fabrications designed to save time, labor and material costs in modernizing piping systems.

**(52) PORTABLE CUTTING TOOLS** covered in Catalog 252 offered by the Manco Mfg. Co., Bradley, Ill., include economical lightweight hand cutters, larger high-capacity bolt cutters, and a complete line of hand-operated units for cutting steel rod, wire, fence, steel strapping, high-tension wire and a wide variety of other materials.

**(53) TRUCK HOISTS**—Bulletin STP188, entitled "You'll Earn More With . . . St. Paul Hoists and Bodies," has been released by St. Paul Hydraulic Hoist, Wayne, Mich. Offering "25% More Payload Per Hoist Dollar," the bulletin outlines in detail the many basic improvements incorporated in the completely redesigned line of hoists and bodies recently released, with complete specifications and payload capacities.

**(54) SAND PUMPS**—Features, capacities and specifications of Denver vertical centrifugal sand pumps are covered in Bulletin P10-B4 offered by the Denver Equipment Co., Denver 17.

**(55) FOR MEASURING LOW SPEEDS**, either rotational or linear, the Metron Series 57M heavy-duty tachometer heads offer the combination of built-in gearing, strength and adequate enclosure to measure low speeds directly under adverse conditions. Technical Data Sheet 57M, from Metron Instrument Co., Denver 9, gives full information.

**(56) RADIAL AIR COMPRESSORS**—Two-stage air-cooled radial air compressors producing 80 to 125 psi are described in Bulletin H-630-B1 published by Worthington Corp., Harrison, N. J. The 12-p bulletin gives capacity and specification data of base-mounted multi-V-belt-driven compressors, base-mounted flexible-coupled compressors and Unabloc (close-coupled) compressors.

**FIRST CLASS**  
PERMIT NO. 66  
(Sec. 34.9, P.L.R.)  
NEW YORK, N. Y.

# BUSINESS REPLY CARD

No Postage Stamp Necessary If Mailed in the United States

Postage Will Be Paid By—

McGraw-Hill Publishing Co., Inc.

THE EDITOR, COAL AGE

330 WEST 42nd STREET

NEW YORK 36, N. Y.



## Beats weather on tough lube job!

• Rain and snow washed the lubricant from the dipper stick and pinion gears . . . hot weather caused it to "melt" and run off. That meant that operators of this shovel used in a northern open pit mining project had to take time from every shift to apply new lubricant. The cost in operators' time and in lubricant was excessive. Dripping grease was untidy and unsafe.

Asked for his recommendations, a Standard Oil lubrication specialist suggested HD CAM AND GEAR LUBRICANT. The dipper stick and pinion gears were steam cleaned. The recommended lubricant was heated and brushed on in a smooth, even coating. HD CAM AND GEAR LUBRICANT has stayed on the job in all kinds of weather, and the lubrication period has been extended from a single shift to as long as two weeks. Dripping has been eliminated, lubrication costs have been cut.

### HD CAM AND GEAR Lubricant

The experience of this mining company points the way to savings you can make through the use of Standard Oil's lubrication engineering service and high quality products. How you can easily and quickly put this lubrication service to work for you is explained at the right.

Standard Oil Company, (Indiana), 910 South Michigan Avenue, Chicago 80, Ill.

**STANDARD OIL COMPANY**



(Indiana)

*What's your problem?*



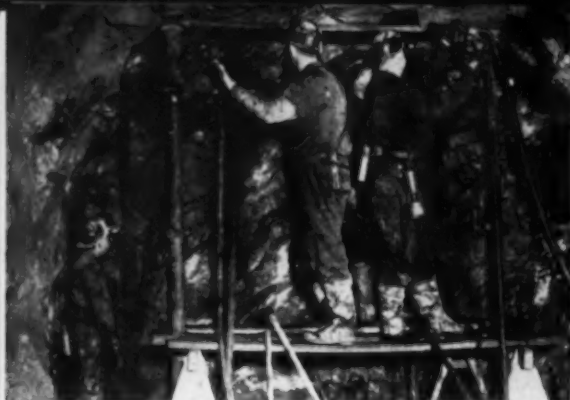
C. F. Klenner, of Standard Oil's Du-luth office, is the specialist who was called in by operators of this mine to help solve their lubrication problem. His practical experience and special training enabled him to recommend a lubricant that did the required job.

C. F. Klenner is one of a corps of Standard Oil lubrication specialists located throughout the Midwest. These men are especially trained to help you with your industrial or mining lubrication problems. To obtain the prompt, on-the-spot services of an experienced lubrication specialist, phone or write your local Standard Oil Company office.

When the specialist calls, discuss with him the benefits offered by such products as:

**STANOIL Industrial Oils**—Simplify your lubrication jobs by using this one line of oils that provides cleaner operation of loader and crane hydraulic units, supplies effective lubrication in compressors, gear cases, and circulating systems.

**SUPERLA Mine Lubricants**—These new, improved oils and greases provide better lubrication of cutters, loaders, locomotives, mine cars, and other underground equipment. They eliminate transmission-case deposits, reduce clutch-plate gumming, and minimize wear on gears and bearings.



#### **PARTS REPLACEMENT DRASTICALLY REDUCED.**

Checking his records after 17 months' top performance from Sun Rock Drill Lubricant, the operator of this Pennsylvania mine found that parts replacement had been reduced 67 percent. The product he had used before kept running off the drills, and downtime was excessive.



**PRODUCTION UP, LABOR COSTS DOWN.** Gummy deposits in the transmission case and heads forced the operator of this mine to shut down his loader every two or three days. Changing to a Sun "Job Proved" product, he now has to grease it only every two or three weeks, and he estimates his savings on maintenance at over \$1,600 a year.

## **SUN PRODUCTS GET THE JOB DONE**

**These four examples show how**



#### **14 YEARS UNDER PRESSURE AND GOING STRONG.**

This compressor has been running 16 hours a day ever since its installation, and is working as well as ever. From the start, a Sun lubricant has been used for the crosshead and air cylinder. No hard carbon has formed, and during the past five years there has been only one shutdown—when a different brand of oil was used by mistake.



**DIESEL PERFECT AFTER 13,680 HOURS.** Thanks to the constant protection of Sunvis H.D. 700 Oil, the pistons were clean, the oil grooves open, the rings free. No signs of seizure or scoring of skirts. Not one of the cylinders showed more than 1/1000 inch wear, the bearings were perfect, the entire engine was clean and free of sludge or varnish. Analysis of the oil showed it to be in good condition.

**For further information or the services of a representative, call the nearest Sun Office**

### **SUN INDUSTRIAL PRODUCTS**

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL



# NEWS Round-Up



## BCOA Spurs Safety Effort, Ankeny to Head Work

Marling J. Ankeny (above), chief of the USBM Coal-Mine Inspection Branch since 1948, took over Aug. 18 the newly created post of safety director, Bituminous Coal Operators' Association, Washington, D. C.

The new position marks increased emphasis by BCOA on mine safety and an extension of its liaison with the Bureau and the UMWA. Mr. Ankeny will serve as assistant in mine safety to Harry M. Moses, BCOA president, and will coordinate the association's safety activities with government administration of the new Federal Coal-Mine Safety Act. He also will be BCOA's liaison man with the Bureau and the UMWA. His work will be educational, advisory and promotional. For the present at least, the post will be a one-man job. Program details will be worked out in the near future.

Joseph Miller, BCOA official, said the association has been looking 2 yr to find "the right man for the job." Mr. Ankeny said he has "accepted the job with great enthusiasm" and that he considers it "a great opportunity to promote safety in the industry."

While serving with the Bureau, Mr. Ankeny helped draft the Federal Coal-Mine Safety Act and the Federal Mine Safety Code. He is a graduate of Carnegie Tech. Prior to joining the Bureau in 1928, he held supervisory and safety positions with coal-mining companies in Pennsylvania. His steady climb upward in the Bureau was interrupted by World War II, during which he served with the Navy. After the war he returned to the Bureau as assistant supervising engineer at Mt. Hope, W. Va.

## President Names Members Of Safety Review Board

Members of the Federal Coal Mine Safety Board of Review created in the federal safety law passed by Congress July 2 were appointed by President Truman Aug. 21. Named to the three-man board to represent the public, operators and miners, respectively, were: Alex U. Miller, of Vincennes, Ind., who was with the USBM from 1917 until his retirement Feb. 28, 1950, at the age of 70; Joseph G. Solari, assistant general manager, Peabody Coal Co., Chicago; and Charles R. Ferguson, acting safety director, UMWA. Under the law, the board will act on appeals from operators protesting mine closings or "gassy" classifications ordered by federal inspectors.

## Local Raps Lewis

A demand that "local unions have a say in their own affairs" was made Aug. 21 in a letter to John L. Lewis from Local 1516, UMWA, Shenandoah, Pa., composed of 800 workers of the Locust Coal Co. The letter also requested that

## Also Featured in This Section

What Lewis Wants	p 128
Personal Notes	p 130
AEC Plant to Burn Coal	p 134
News Briefs and Trends	p 136
ACI Estimates 1952 Tonnage	p 136
New Mine Developments	p 138
Welfare Fund Report	p 138
Open-Pit Electrical Meet	p 142
Obituaries	p 160
Association Activities	p 162
New Preparation Facilities	p 164
Among the Manufacturers	p 187
New Books for Coal Men	p 192

salaries of union officials be turned over to the UMWA Health and Welfare Fund during the coming 10-day memorial period. Citing slow working time from which they must pay \$4 monthly dues and the present special assessment of \$2, the local said: "We can't even collect unemployment compensation, thanks to our leaders who have blocked every avenue of income."

## Flowers Joins Coal Age



A. E. (AL) FLOWERS, formerly chief engineer of the Clinchfield Coal Corp., Dante, Va., joined the Staff of *Coal Age* Aug. 18 as an assistant editor. Mr. Flowers has had a varied background in anthracite and bituminous coal mining, having held various positions in engineering and production in the eastern Appalachian coal fields.

He was born and received his elemen-

tary and high school education in Harrisburg, Pa. In 1939 he entered The Pennsylvania State College to study mining engineering. During summer vacation periods he worked for The Hudson Coal Co., Scranton, Pa., as an engineer-in-training. Upon graduation from Penn State in 1942 with a B.S. degree in mining engineering, Mr. Flowers joined Clover Splint Coal Co., Clossport, Ky., as mining engineer. In the fall of 1946 he returned to Penn State as an instructor in mining engineering and research engineer on mechanical-mining methods. While there he earned a master of science degree in mining engineering and the technical degree of engineer of mines.

Returning to the bituminous coal mining industry in 1949, Mr. Flowers joined the Clinchfield operating department as assistant superintendent of the Moss mine, in Wise and Dickenson Counties, Virginia. Early in 1951 he was transferred to the engineering department at the main offices in Dante, Va., as mining engineer, and in June of that year was promoted to the position of chief mining engineer. When R. H. Hughes, chief engineer, was promoted to vice president in charge of operations, Mr. Flowers was advanced to the position of chief engineer, in charge of all engineering, and held that position until joining *Coal Age* last month.





Wide World

## What Lewis Plans

**HOW MUCH MONEY—in wages, welfare-fund payments or what have you?**

**WHAT CHANGES in the basic structure of agreement—hours per day, safety, and management rights, as examples?**

These became the major questions with the recent filing by Mr. Lewis of notices of agreement termination as a prelude to the opening of new negotiations in 1952. Whether the notices actually provided for a specific termination date still was in question at the time of this writing. The first notice, dated July 22, was filed with Harry Moses, president, Bituminous Coal Operators' Association, and was followed by notices dated Aug. 1 to the Southern Coal Producers' Association and the anthracite operators. The text, differing only in details for the anthracite industry, was as follows:

"The National Bituminous Coal Wage Agreement of 1950, as amended Jan. 18, 1951, to which your association and the United Mine Workers of America subscribe, contains the following language:

"This amended agreement, dated Jan. 18, 1951, shall be effective as of Feb. 1, 1951, and is not subject to termination by any party signatory hereto prior to March 31, 1952, provided, however, that either the parties of the first part or the party of the second part may, on or after March 31, 1952, terminate this agreement by giving at least sixty (60) days' written notice to the other party of such desired termination date."

"With due authorization, I herewith give formal notice of termination of the agreement as provided in the above quoted excerpt from the joint contract. Statutory or other legal rights due you, as first party, or to the mine workers, as second party, under said contract or under this notice, remain unimpaired.

"The United Mine Workers of America

now offer to meet and confer with you or the authorized representatives of your association for the purpose of negotiating a new contract. We will adapt ourselves to any reasonable arrangements as affecting the number of negotiators representing each party, and the time and place of meeting.

"We await your advice."

### What Lewis Wants

In line with what seems to be the new pattern in negotiations, no hint of the demands the union might make was released in advance, and the preliminary meetings have been conducted behind a curtain of silence. Therefore, there is no definite indication of what Lewis really wants, and forecasting the final settlement becomes an exercise in what one fondly hopes is logic. By that means, supplemented by plain guesses, some of the things Mr. Lewis is or will ask for are:

1. A wage increase larger than that won by the steel workers.
2. An increase of 10c or more per ton in the welfare-fund levy.
3. An increase in shift differentials, a la steel.
4. Longer vacation periods and increased vacation pay, a la steel.
5. A certain number of paid holidays, a la steel.
6. A shorter work day, still with an increase in daily wages.
7. Further restrictions on the rights of management in seniority, equalization of operating schedules and so on.
8. Strict safety provisions.

### What Lewis Will Get

Prophesying on this score is about as hazardous as trying to list demands out of thin air. But there are perhaps a few more guides along this road than along the other. One thing, for example, can be counted as certain:

The settlement Lewis will accept from

the coal industry will have to be at least as good—in money and perhaps otherwise—as that won by the steel workers. In round numbers, that is a 21c-an-hour package. He probably would like more but the extra difficulty of getting it might lead him to settle for the steel package. Perhaps the 21c or \$1.68 per day—or more if it should turn out that way—might be apportioned among the various payments to the miners or into the welfare fund. In other words, part would be in the form of wages, part in shift differentials and part in an increase in the welfare levy. Whether overtime increases, extra holiday pay and paid holidays, assuming any or all of them would be pressed for, would be included in the package too—if package there was—is a question, but there might be a good chance that these would be the extras.

Lewis may or may not make a fight for a shorter work day, though it may be expected eventually if not now. He probably will attempt to obtain more-stringent safety provisions. Also, he may or may not maintain seriously earlier ideas—and possible new ones—on limitation of working time and other restrictions on management rights, including absolute seniority, transfer of men, scheduling of machine installation and so on, plus the guaranteed annual wage.

Perhaps publicity and trading advantage may be the goals in demands of this type. But if seriously maintained and finally forced on the industry—now or later—the demand for limitation on working time by penalty wage hikes beginning the fourth day of the week would be the most deadly of all. Ostensibly put forth to equalize working time and keep mines in being for a national emergency, the proposal would stop cost reduction and quality improvement practically completely by penalizing efficiency and investment to improve product. In addition, among its other disadvantages, it would limit the miner to three days work per week, and thus accelerate the migration to other industries, in turn defeating the ostensible purpose of productive capacity in being for a national emergency.

### Help and Hindrance

Although Lewis in some respects is not in quite as favorable a position as usual, he still goes into the negotiations fairly well armed. Among the factors in his favor are:

1. The pattern set by the steel settlement. This settlement also reflected the fact that the government is now engaged in screwing up the level of union wages, in addition to lending its help in getting other concessions, this in spite of Congress-impelled changes in the Wage Stabilization Board. The process has been going on for some time, with the result that the public and union membership has been conditioned to another round.

2. The weakness of the captive position. Perhaps their position isn't weak, but after the lumps steel received from Truman and Murray, it could hardly look forward to another round with Mr. Lewis with any degree of pleasure.



Therefore, even though steel is better fixed in stocks than for a long time, it might well be inclined to sign a bellwether agreement giving Lewis perhaps a little more than he might otherwise expect, especially since the federal government would probably throw even heavier weight around to prevent another steel stoppage.

Even though Lewis has demonstrated his ability to ignore what would be overriding pressures to other people, there still exist some conditions that work against a clean sweep in the negotiations. Among them are:

1. Large stocks of coal in storage, even in steel. Also, the multifuel boiler is more of a factor than it was the last time, providing major consumers with an even-better opportunity for switching to other fuels. Both these conditions make it harder to reduce stockpiles to the point where the economic pinch is severe, even if non-union tonnage was not today a much larger factor than a few years ago. Now, non-union and cooperative operations probably could supply 25% of the normal output.

2. The market situation does not favor an open-handed policy by the commercial operators. Also, many of them are experiencing increasing competition from non-union or substandard union mines. If steel should serve as the bellwether, however, the commercial operators once again would find themselves faced with an accomplished fact and encountering deaf ears where they otherwise might get support. But what about afterward? Perhaps Lewis feels he can afford to ignore the impetus this would give to non-union development—and perhaps not.

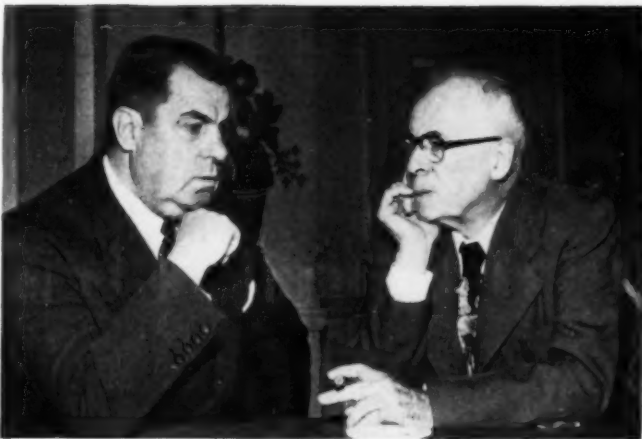
3. The welfare fund would take it on the chin if there should be a work stoppage of any length. The fund is becoming somewhat the tail that wags the dog and a long strike would cost the fund real money, since it would mean a repetition of the situation last time when many users turned to other fuels.

### Strike or Not?

Whether or not there will be strike in 1952 is of course anybody's guess. One factor is Mr. Lewis' demands and how hard he wants to press them. Evidence indicates that a fair share of the commercial operators would not mind a stoppage, especially if there seemed a reasonable prospect that it might reduce the bill they would have to pay. Steel, on the other hand, could hardly be blamed for trying to avoid a strike in the mines after the long stoppage in the mills.

Lewis has never been particularly dismayed by the prospects of a strike if he feels that it will help him gain what he really wants. Usually, when he calls a strike it brings the federal government in on his side, and this year it can be expected that the government would exert itself even more than usual in his behalf to prevent another steel shutdown.

A quiet agreement could come, but at the same time there is no reason to believe that Lewis will hesitate to strike if things are not going to his liking.



**TOP ANTHRACITE NEGOTIATORS** as contract talks opened Aug. 19 were Edward G. Fox (left), P. & R., and Thomas Kennedy, UMW.

## Higher Output for Wage Increase, Anthracite Negotiators Ask Union

Economic conditions in the industry make a wage increase unjustified without a real attempt to boost output per man-day, anthracite operators maintained at the start of contract negotiations in New York Aug. 19.

A suggestion that operators and union join in an effort to improve production was one of five proposals put forth by the management negotiating group headed by Edward G. Fox, president of the Philadelphia & Reading Coal & Iron Co. Thomas Kennedy, UMW vice president, led the union delegation in the absence of John L. Lewis, who had reportedly been detained by other business.

### Make Five Proposals

As outlined at a press conference afterwards, the management proposals read into the record at the meeting were:

1. A joint program between operators and union to improve production per man-day. Under present economic conditions in the industry, any increase in wage rates is unjustifiable without assurance that the industry's mine force will make every effort to increase output.

2. A simplification of the wage structure to absorb into the regular wage structure the present per-diem payments.

3. A review of the health and welfare fund to find a way to improve its administration while spreading its cost equitably among all anthracite producers.

4. A joint effort to further improve safety conditions, in the same spirit of cooperation demonstrated by anthracite operators in supporting the recent Federal Mine Safety Act.

5. A program jointly endorsed and supported to employ wherever applicable and desired the maximum use of tools and equipment for mine mechanization.

Commenting on the first two points, Mr. Kennedy said that they were "negotiable," but that the union was not then committing itself to anything and would present recommendations of its own later.

### Memorial Not in Contract

The 10-day memorial period called by the UMW is a violation of the anthracite contract, operators' representatives maintained in a letter to Mr. Lewis which they attempted to release to the press on the second day of the negotiations. Release of the text was opposed by Mr. Kennedy because the letter was the property of the committee and joint agreement was needed for such action and also because Mr. Lewis had not yet received it. Mr. Kennedy cited the "willing and able" clause as basis of the memorial, but was reminded by Mr. Fox that that clause was not a part of the current contract, which does not make specific provision for a memorial period as does the bituminous agreement. At the same time, the anthracite contract contains no definite bar to a memorial and does not include a no-strike clause, union spokesmen pointed out.

The operators' charge that the memorial was illegal is a "malicious attack" on the UMW which "I personally resent," Mr. Lewis said in his reply to Mr. Fox. He released the full text of his letter to the press following a 90-min bargaining session in Wilkes-Barre Aug. 26. After 3 days of meetings in New York the conference had been adjourned to that date in Wilkes-Barre and following that meeting was further recessed to Sept. 3, with meetings to be resumed in Washington. According to reports, the negotiating sessions had yet to discuss the main question—increased wages.

# Personal Notes



## Snoberger Heads Truax-Traer

R. E. SNOBERGER, executive vice president, was named president of Truax-Traer Coal Co., Chicago, at a directors' meeting July 31, succeeding A. H. Truax, advanced to chairman of the board. Mr. Truax succeeds G. W. Traer, who remains chairman of the executive and finance committee. J. H. Price, vice president of a subsidiary sales company, was named vice president. Other personnel changes announced were E. M. Cassidy as general manager of the West Virginia Div., and M. H. Schumate and Tony Taucher Jr. as assistant general managers. Mr. Cassidy formerly was assistant general manager; Mr. Schumate was general superintendent; and Mr. Taucher recently came to Truax-Traer from The Union Pacific Coal Co. Henry R. Platt Jr., Chicago banker, has been elected vice president and treasurer, succeeding J. O. Westlund, retiring after 25 yr.



## Steidle Now with P. & R.

HOWARD STEIDLE (left) has been made executive engineer, Philadelphia & Reading Coal & Iron Co., Philadelphia. He formerly was associated with the Pittsburgh Consolidation Coal Co. and later with the Foreign Minerals Region of the USBM and DMA where he assisted in the production of vital minerals and metals. A mining-engineering graduate of Pennsylvania State College, Mr. Steidle also holds a Master's Degree from Harvard Business School.

Johnstown Coal & Coke Co., Johnstown, Pa., has elected Harry A. Crichton president, succeeding his brother, the late Andrew B. Crichton, founder and president of the company since its organization in 1913. The new president has served the company since 1928 as vice president in charge of sales and will continue his headquarters in New York City. Other officers named were C. N. Crichton, Johnstown, vice president and treasurer; John N. Crichton, vice president in charge of operations; and G. T. Crichton, vice president in charge of the Charleston, W. Va., sales office. Re-elected as vice presidents were A. B. Crichton Jr., who will serve the company in a sales and consultative capacity; and W. D. Hughes, who is moving his headquarters from Portage to Johnstown and will head the company's real-estate department.

The Norfolk & Western Ry., Williamstown, W. Va., announced the retirement of O. W. Evans, superintendent of its mining department, after 35 yr in company service. Mr. Evans will be succeeded by E. S. Hamilton.

John Eadie, safety inspector, Sahara Coal Co., Chicago, has retired after more than 30 yr of service with the company. Mr. Eadie, who is 70, began his mining career helping his older brother in the Kansas mines at the age of 10. He has been the inspector for all Sahara mines for the past 20 yr.

George Duglinson Jr., executive vice president of the Norfolk & Western Ry., Roanoke, Va., has retired after more than 44 yr of service. He will continue to serve N&W in an advisory capacity as chairman of the company's development committee. With Mr. Duglinson's retirement, the office of executive vice president will be abolished.

Alfred W. Wagner, personnel and safety director, C. A. Hughes & Co. and Rich Hill Coal Mining Co., Cresson, Pa., has resigned to engage in his own business, a personal adjustment service of workmen's compensation accounts for self-insured employers. Before entering the coal industry more than 10 yr ago, Mr. Wagner worked with the U. S. Forestry Service.



## Glen Alden Advances Everett

WILLIAM W. EVERETT, formerly general superintendent, has been named to the newly created post of manager of mines, Glen Alden Coal Co., Wilkes-Barre, Pa., with responsibility for all company mining operations. Associated with Glen Alden since his graduation from Pennsylvania State College in 1925, Mr. Everett has held every job in the mining end of the business and has been a member of the Mine Inspectors' Examining Board since 1946. The appointment of Frederick L. Klipple to fill Mr. Everett's former post and the advancement of F. Edgar Kudlich, formerly mining engineer, to the new post of manager of engineering also have been announced. Mr. Klipple, formerly assistant general superintendent, joined Glen Alden's engineering department in 1918 and has held various supervisory posts throughout the company. Mr. Kudlich became associated with Glen Alden in 1947 as chief assistant mining engineer and shortly thereafter was promoted to mining engineer. A graduate of Lafayette College, Mr. Kudlich held engineering posts with various coal companies, including 16 yr with Lehigh Valley Coal Co.

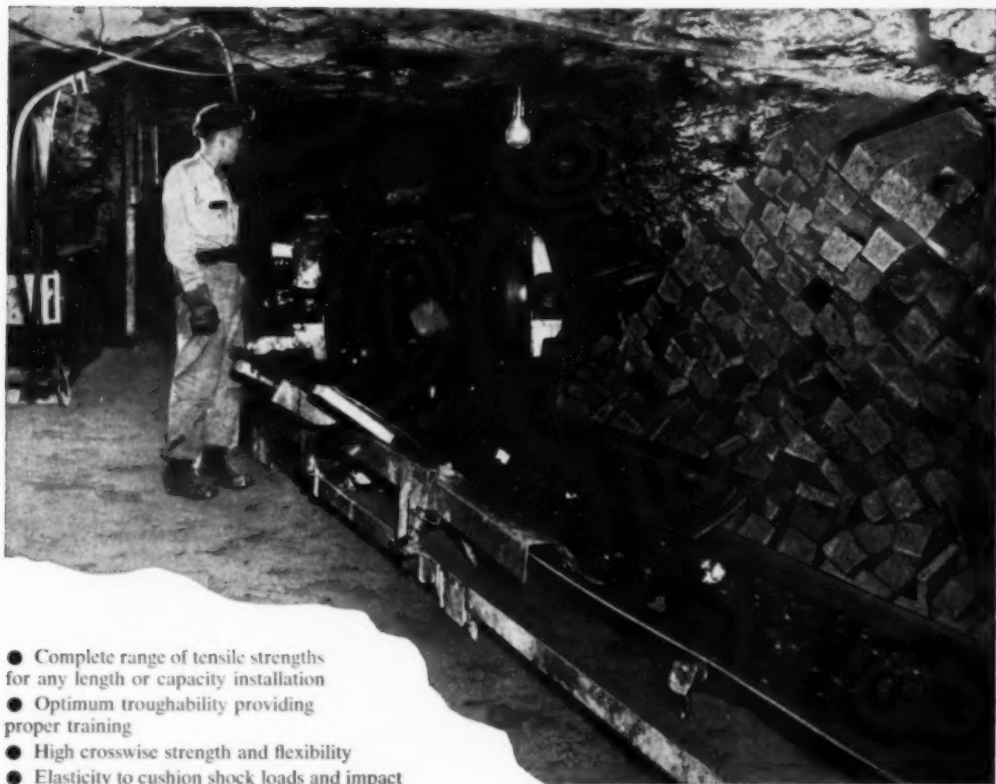
Lawrence Jones has been named general mine inspector, Ebensburg Coal Co., Colver, Pa. He formerly was associated with Berwind-White Coal Mining Co. as general assistant foreman.

James Froggatt has been promoted to superintendent, Rich Hill Coal Mining Co., Cresson, Pa., to succeed John J. Brazil. He served as assistant general superintendent of C. A. Hughes & Co., a subsidiary company.

Alex Laird, assistant superintendent, has been named superintendent, Mine No. 10, Pennsylvania Coal & Coke Corp., Gallitzin, Pa., succeeding the late D. Russell Chase. Frank Skupien has been

(Continued on p 158)

# What are the outstanding features of U. S. Rubber's Giant Underground Belts?



- Complete range of tensile strengths for any length or capacity installation
- Optimum troughability providing proper training
- High crosswise strength and flexibility
- Elasticity to cushion shock loads and impact
- Exceptional fastener holding ability
- High quality rubber covers to withstand abrasion, cutting and gouging
- Skim between all plies for increased flex life over small underground pulleys
- Resistance to acid mine waters
- Mildew inhibited carcass

U.S. Giant Underground Belts are obtainable at your nearest U.S. Rubber Mechanical Goods distributor or "U.S." factory branch.

**TRANSFER POINT** between two 30" 4 ply Style XN U.S. Giant Conveyor Belts. Style XN is a patented construction of cotton and Nylon carcass embodying greater strength and crosswise flexibility at no increase in weight over conventional type belts. More than 15,000 ft. of this belting is operating in this mine.

PRODUCT OF

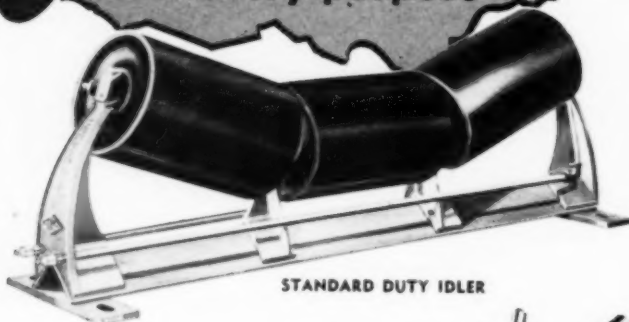
**U.S. RUBBER**  
SERVING THROUGH SCIENCE

**UNITED STATES RUBBER COMPANY**  
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

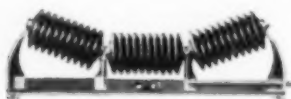
THERE'S A .....

# Continental IDLER

for every purpose



STANDARD DUTY IDLER



RUBBER DISC IMPACT IDLER



SELF-ALIGNING  
TROUGHING IDLER



SELF-ALIGNING FLAT BELT IDLER



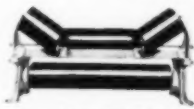
FLAT BELT IDLER



HEAVY DUTY IDLER



PICKING TABLE IDLER



GRAIN CONCENTRATOR IDLER



GRAIN FLAT BELT IDLER



UNIT STAND IDLER

*Specify*

**CONTINENTAL.....**

Belt conveyors are used for handling many types of material. For this reason, Continental manufactures a variety of Idlers, each designed to best take care of a particular application.

When ordering your next Belt Conveyor, specify Continental Idlers and take advantage of their complete line.

Most standard size Idlers can be shipped FROM STOCK. Other sizes can be shipped promptly.

CG-1002

**INDUSTRIAL DIVISION  
CONTINENTAL GIN COMPANY**

BIRMINGHAM, ALABAMA

ENGINEERS



ATLANTA • DALLAS • MEMPHIS • NEW YORK



MANUFACTURERS

# 4 BIG PRODUCERS FOR YOUR MINE!

WHERE big production talks, the LaPlant-Choate line of Motor Scrapers and Motor Wagons fill the bill. Money-saving interchangeability keeps your machines working and earning, and reduces your equipment investment on every job. In either the 200 or 300 size, you can use your LPC Tractor with its matching LPC Scraper to grade and surface haul roads, build truck turn-arounds, level building sites, move spoil banks, strip overburden, or for any earthmoving job where high speed, big capacity and big power are needed. The same Tractor coupled to a matched LPC Wagon gives you a fast, big-production hauling unit.

See your LaPlant-Choate distributor today for details about these production twins . . . let him tell you how to move more material at still lower cost.

2 TS 200 MOTOR SCRAPERS Grade for  
Railroad to Paradise Mine for

**MULLIGAN BROS., INC.**  
GREENVILLE, KENTUCKY

FOR a small but important job, building this railroad grade to Paradise Coal Mine was no cinch! Mulligan Bros.' two TS 200 Motor Scrapers moved 50,000 yds. of the toughest kind of material . . . a mixture of clay, rock and sand, filled with roots. Working a steady, productive 10-hour shift each day, the TS 200's hauled 10 pay yards each trip over poor haul roads. Average loading time was 45 seconds. Dumping the roots and rock was no problem because of positive forced ejection plus the extra high apron lift. This is a typical example of Motor Scraper performance and dependability on machine-killing jobs.



## LaPLANT-CHOATE TS 200 MOTOR SCRAPERS AND TR 200 REAR DUMP ROCK WAGONS

THE TS 200 Motor Scraper is a 10 to 13 yd. hydraulically controlled earth-mover for your smaller jobs, yet has all the speed, power and capacity for high production on long haul jobs. Speed . . . over 21 mph; positive double-acting hydraulic steering and hydraulic operation of bowl and ejector for direct, instantaneous control; your choice of a 176 HP Buda or a 165 HP Cummins diesel, are but a few of the outstanding TS 200 features.

The 18-ton TR 200 is a hydraulically controlled rear dump rock wagon which can be used interchangeably with the S 200 Scraper. It tilts 70° from the horizontal and its stable wheel base and 4-wheel brakes assure absolute safety when dumping over the edge of a fill. Rock lug tires, a protected cab and full hydraulic control are included among the many efficiency features.



## FOR YOUR BIGGEST JOBS!

### TS 300 MOTOR SCRAPERS AND TW 300 MOTOR WAGONS

WHEN you have a big earthmoving job, you can depend on the high production advantages of the fast, powerful TS 300 Motor Scraper. Big capacity . . . 14-cu. yds. struck and 18-cu. yds. heaped. Speeds in excess of 22 mph. Big power . . . with your choice of either a 280 HP Buda or a 275 HP Cummins diesel.

The TW 300 is a hydraulically controlled bottom dump wagon which can be interchanged with the S 300 Scraper. 14- to 19-cu. yd. capacity, big 24:00 x 29 24-ply tires to carry heavy loads, double-acting hydraulic steering and hydraulic door control for effortless, trouble-free operation, large 4-wheel air brakes and many other money-saving features make this wagon outstanding in its field.



**LAPLANT**  
MANUFACTURING CO., INC.

**CHOATE**  
CEDAR RAPIDS, IOWA, U. S. A.



# Coal Plants to Supply 1,800,000 Kw For New Ohio Atomic Energy Project

Two coal-fired steam-driven generating plants with a total capacity of 2,200,000 kw will be built by a newly formed group of 15 power companies to supply the needs of the new \$1,200 million plant in Pike County, Ohio, announced by the Atomic Energy Commission Aug. 12.

The AEC plant, which is to produce uranium-235, a component of the atomic bomb, is to be located on the Scioto River, between Piketon and Wakefield, some 22 mi north of Portsmouth, Ohio. While negotiations had not been completed at the time of the announcement and the site of the two power plants, which will be kept separate for security and other reasons, were subject to change, it was expected that they both would be located on the Ohio River. One would be in southeastern Indiana near the Ohio and Kentucky borders and the other in the southern tip of Ohio in the general Portsmouth area, according to preliminary reports.

The Ohio Valley Power Corp., the newly organized firm sparked by the

American Gas & Electric Co., New York, is expected to spend some \$400 million for the generating and transmission facilities to supply the AEC plant's eventual demand of 1,800,000 kw. The power contract, though still not final, is believed to be the largest of its type ever undertaken. The plant's initial requirements of 400,000 kw will be supplied by the existing facilities of the 15 utilities making up the group. While construction of the AEC plant is expected to take 4 yr, individual units will go into operation as they are completed, beginning in 1954.

In Louisville, Ky., L. C. Goering, coal traffic manager of the L.&N., announced that his road already had an application before the ICC to haul coal from eastern Kentucky by rail to Cincinnati and from there by barge on the Ohio River to the proposed power plants.

Utility companies joining to form the new Ohio Valley Power Corp. are Appalachian Electric, Indiana-Michigan, Ohio Power, Ohio Edison, Pennsylvania Water & Power, West Penn Power, Potomac Edison, Monongahela Power,

Toledo Edison, Dayton Power & Light, Columbus & Southern Ohio Electric, Cincinnati Gas & Electric, Kentucky Utilities, Louisville Gas & Electric and Southern Indiana Gas & Electric.

## Prosecute Non-Union Mines, UMWA Asks Colorado Inspector

The UMWA demand that Fremont County, Colorado, coal-mine operators be prosecuted under the state mine safety laws was renewed early last month following new federal safety inspections and the death of an area miner in a cave-in. Now under an injunction limiting its organizing efforts in Fremont County, the union has for some months been seeking state action on a number of non-union mines in that and other counties. Citing violations of both the federal and state codes reported after federal inspection of two mines, Fred Heffler, secretary-treasurer, District 15, UMWA, Denver, wrote Tom Allen, Colorado state mine inspector, Aug. 4 formally requesting that he press J. S. Witcher, district attorney, Canon City, for prosecution of the operators. On July 5 he had reportedly written Mr. Witcher citing repeated violations of the state law by seven operators, and in his letter to Mr. Allen said that he had had no reply from Mr. Witcher.

## UNITED MINE WORKERS OF AMERICA

August 16, 1952

### NOTICE NATIONAL MEMORIAL PERIOD

#### ATTENTION:

Coal Operators and Coal Companies  
Signatory to the Joint Industry Agreement

Officers and Members of Local Unions,  
United Mine Workers of America  
United States Bureau of Mines and  
Federal Inspectors

State Mining Departments and State  
Inspectors

#### Greetings:

Exercising its option, the International Union, United Mine Workers of America, declares a Memorial Period from August 23, 1952 to September 1, 1952, inclusive, during which time the production of coal will cease. All other necessary work incident to the industry requirements will continue during the period designated.

#### Let's We Forget

Less than eight months have elapsed since the nation was shocked by the unnecessary Yuletide horror of the West Frankfort Mine disaster. The frightful disaster killed 119 men. In the wake of this economic massacre are the bereaved widows, the helpless orphans, the broken homes, the stricken communities, accompanied by grinding poverty, broken life's dreams and the crushing weight of human sorrow.

Death continues its ravages in the coal industry. Since December 23 of 1951 and through July 31, 1952, 334 miners have been killed, and approximately 20,040 mine workers have been maimed. During

the same brief period, Federal Mine Inspection Records reveal a total of 52,256 violations by mine management of safety provisions of the Federal Mining Code. Of this number, 29,007 were repeat violations. As of July 31, 1952, there existed 37,387 uncorrected violations of the Federal Mining Code. This is an appalling record, emphasizing negligence and disregard of human life by mining companies, and in many instances approximates criminal intent. It cries aloud for redress by those who are sufficiently fortunate to remain alive and unmaimed in this savage industry. It is fitting that during this Memorial Period tribute should be paid to those who have made the great sacrifice, and that every effort should be made to lessen the bloodletting and wastage of human flesh which constitutes our national shame.

#### Obligations of Mine Management

With the coming of the autumn equinox, we enter a period of sharp barometric changes, which will intensify the ever present perils of the mines. A decent respect for human life and the preservation of property values impel the taking of protective steps. During this Memorial Period when production is abated, the management of each mine, with the co-operation of each mine worker, should place it in a legally safe condition; ventilation should be made adequate to meet all standards and any barometric change; air courses and haulage roads should be made clean; accumulated coal dust should

be removed; rock dusting should be completed to meet requisite standards; all machinery and electrical equipment should be put in order; and all other necessary steps should be taken to make each mine not only legally and contractually safe, but safe from every standpoint of collective good judgment and sound mining practice.

#### Obligations of U. M. W. of A.

Safety Committees and local union officers will confer with management affecting the safety problems of each mine, and will make available, at the request of management, any number of men that may be required for work during the period. All work on construction, installation, sinking and repair will continue as usual.

#### Functions of Federal And State Inspection Forces

The United States Bureau of Mines and the Mining Departments of the several states can cooperate greatly during this period of non-production by insisting that mine management effectuate immediate compliance with previously issued instructions and recommendations hitherto ignored by mine management. Members of the United Mine Workers of America will give unqualified cooperation to inspectors of the State and Federal Governments in this task.

Production of coal will be resumed Tuesday, September 2, 1952.

#### INTERNATIONAL UNION, UNITED MINE WORKERS OF AMERICA

By: JOHN L. LEWIS, President

#### ATTEST:

THOMAS KENNEDY, Vice President  
JOHN OWENS, Secretary-Treasurer



*Equipped with  
the coal-cleaning  
process that gives  
99+% recovery*



**CHANCE PROCESS**

**THE HEART OF THE  
PREPARATION PLANT**

At the Georgetown mine of the Hanna Coal Company, division of the Pittsburgh Consolidation Coal Company, is the world's largest commercial coal preparation plant. It is also one of the most modern, with the finest coal-handling and coal-cleaning equipment. An important part of this equipment is a Chance 16'-6" Cone and a Chance 12'-0" Cone with a total capacity of 700 r.o.m. tons per hour and a very high separating efficiency.

Other outstanding features of the Chance heavy-density, sand-flotation process include:

High degree of flexibility—ability to handle coal at operating gravities from 1.35 to 1.65, with size range as wide as 10" x 1/8" to one washing unit.

Dependable performance—steady, uniform, trouble-proof operation. Specific gravity of mixture remains constant; efficiency of separation is unaffected by fluctuating loads or changing qualities of coal.

Easy operation—change-over from one washing gravity to another can be made in five minutes, simply by opening or closing valves . . . all under one-man control.

Whatever your preparation requirements, there's a Chance cone to meet them. Our engineers will be glad to cooperate with you in solving any of your coal-cleaning problems.

**UNITED ENGINEERS & CONSTRUCTORS INC**

NEW YORK 17

PHILADELPHIA 5

CHICAGO 2

WITH A BACKGROUND OF OVER SIXTY YEARS' EXPERIENCE

# News Briefs and Trends

## Christopher Coal Sponsors Seam-Degasification Study

Research on the possibilities of degasifying coal seams in advance of mining is currently being sponsored by the Christopher Coal Co., Div. of Pittsburgh Consolidation Coal Co. The work, under the direction of the West Virginia University School of Mines, is particularly concerned with the Pittsburgh seam and associated strata and is of special importance in future mining of that seam in northern West Virginia where the principal virgin reserves are characterized by increasing depth of overburden and the prospect of greater gas liberation. In the field tests being carried on at the company's property near Pursglove, the two holes already drilled have shown sustained methane liberation and give promise of appreciable gas drainage. G. R. Spindler, director of the School of Mines, reported. Following tests with vacuums, booster pressures and shooting in the two holes and others that may be drilled, the area affected will be opened by underground mining, according to plans.

## DSFA Urges Early Coal Buying

Coal users were urged July 31 by the Defense Solid Fuels Administration to get their coal as soon as possible this year to ease "potential spot coal shortages" this winter. If iron-ore shipments are diverted to the railroads in an effort to make deliveries slowed during the steel strike, the diversion would take open-top cars normally used for coal and lead to possible shortages during the peak winter months, Charles W. Connor, DSFA Administrator, pointed out.

## Six European Nations Merge Coal and Steel Industries

Beginning an unprecedented example of international cooperation among six Western European nations, the High Authority for the Schuman Plan held its first session in Luxembourg Aug. 10. Purpose of the plan, which was originated in 1950 by Robert Schuman, French foreign minister, is to create and maintain a single market for coal and steel throughout the six-nation community, end restrictions and discrimination and expand and modernize the industries for the benefit of all participating. The six nations—France, Germany, Italy, Belgium, Netherlands and Luxembourg—have officially approved the principles of the Schuman Plan, but the High Authority has the complicated, tedious task of actually putting the program into operation, compromising the economic rivalries of the nations and negotiating tariffs, prices and other factors with countries outside the group. The program was hailed by statesmen as a beginning of a community effort that Europe must accomplish if it is to finally achieve unity, prosperity and peace.

## P&R Awards Two Taggart Scholarships

Ralph E. Taggart Memorial Scholarships in mining engineering have been awarded by Philadelphia & Reading Coal & Iron Co. to Thomas V. Falkie, Mount Carmel, Pa., and Carl Tilmont, Centralia, Pa., both 1952 graduates of high schools in the company's area of operations. Valedictorians of their respective classes, Messrs. Falkie and Tilmont won their scholarships in competition with 19 other applicants, and both will enter Pennsylvania State College in September. The scholarship was established in 1951 as a memorial to the late Ralph E. Taggart, president of P&R for 15 yr. Officials of the company pointed out that while it is not customary to award more than one scholarship a year, the winners

## Add . . . 50 TOP 1951 MINES

Omission of Mines Nos. 1 and 3 of the Powhatan Mining Co. from the list of the 50 largest producing mines of 1951 published in June *Coal Age* has been called to our attention by E. F. Maurer, general manager. In 1951, Mine No. 1 produced 1,210,550 tons and Mine No. 3 had an output of 1,358,440 tons. *Coal Age* and its affiliate, *Keystone Coal Buyers' Manual*, which compiled the listing from its records on several thousand mines, regret the oversight.

were so close in final standings that it was difficult to make a single selection. The 1951 winner, Robert Zmudzyn, Shamokin, Pa., is working for the vacation period with the engineering corps of P&R's Ashland division.

More Briefs on p 172

## 1952 Bituminous Demand Near 500 Million Tons

The bituminous coal industry "obviously is within reach of another 500-million-ton year" in 1952, reported Appalachian Coals, Inc., Cincinnati, in releasing last month its estimates of coal demand for the rest of the year. ACI's detailed estimate of 1952 demand, as shown below, adds up to 495.5 million tons, with 252.5 million tons of the total occurring in the last 6 mo. Coal demand in the last quarter of the year is expected to total 141,130,000 tons, as compared with 111,370,000 tons in the third quarter.

In its detailed analysis of the factors involved in the estimated consumption by various classes of coal customers, ACI points out that "The first 6 mo of 1952 has been a period of contrasts, mixed trends and uncertainty for American business in general. . . . The consensus of informed business analysts is that the last half of the year will produce a volume of

goods and services at least the equal of the first half, before output was depressed by the long and costly economic war of attrition in steel. The greater impact is expected in the fourth quarter."

While noting that contract negotiations may change the over-all picture, ACI points out in its detailed analysis that steel production will run at above rated capacity throughout the rest of 1952 and that electric utilities, whose output was depressed by the steel strike, will show a larger increase over year-ago figures than that recorded in the past 3 mo. Railroad carloadings, predicted to drop 1.2% below 1951 in the third quarter, should at least equal, or perhaps exceed, 1951 in the last quarter. Retail sales are recording a reversal of the lower trends evidenced in the first half of 1952. In case of a cold winter, shortages of both fuel oil and natural gas may be expected to develop, it said.

## ACI ESTIMATES OF 1952 BITUMINOUS COAL DEMAND

(Thousands of Net Tons)					
	First Half	July-Sept.	Oct.-Dec.	Second Half	Total Year
Electric utilities.....	49,900	24,500	28,700	53,200	103,100
By-product ovens.....	43,300	19,200	26,400	45,600	88,500
Beehive ovens.....	4,300	1,800	2,600	4,400	8,700
Steel & rolling mills.....	3,500	1,300	1,800	3,100	6,600
Cement mills.....	4,000	2,100	2,200	4,300	8,300
Railroads.....	21,200	10,700	13,100	23,800	45,000
Other industrials.....	49,500	22,000	27,500	49,500	99,000
Retail deliveries.....	35,000	14,900	24,100	39,000	74,000
<b>TOTAL U. S.</b> .....	<b>210,700</b>	<b>96,500</b>	<b>126,400</b>	<b>222,900</b>	<b>433,600</b>
Bunker.....	300	270	280	550	850
Canada.....	9,600	7,100	6,400	13,500	23,100
Overseas.....	17,100	6,000	6,500	12,500	29,600
<b>TOTAL EXPORT</b> .....	<b>27,000</b>	<b>13,370</b>	<b>13,180</b>	<b>26,550</b>	<b>53,550</b>
Stocks.....	4,500	.....	.....	.....	4,500
Miscellaneous.....	800	1,500	1,550	3,050	3,850
<b>TOTAL ALL</b> .....	<b>243,000</b>	<b>111,370</b>	<b>141,130</b>	<b>252,500</b>	<b>495,500</b>

# Practical Assistance



Whether it's a tight squeeze in a cookie jar or a bottleneck in your mining operations... practical assistance—the kind that solves the problem simply and fast—is your best answer. And **PRACTICAL TECHNICAL ASSISTANCE** is a Cities Service specialty.

Cities Service Lubrication Engineers can offer *practical assistance* that will eliminate bottlenecks caused by faulty lubrication... will mean dollars, man-hours and equipment saved. They're specialists in the industry's most effective lubricating practices. In addition, they offer the most complete line of Cities Service quality lubricants.

## but check for yourself:

- ✓ Check on the high quality of all Cities Service lubricants. Ask critical users. Or better still, test them on the job.
- ✓ Check the complete Cities Service line for the correct lubricant for every need. Deliveries are quick—and dependable.
- ✓ And finally, discuss your problems with a Cities Service Lubrication Engineer... he's probably solved many like them for other mining operations. Write or phone **CITIES SERVICE OIL COMPANY, Dept. I-9**, Sixty Wall Tower, New York City 5... or get in touch with the office nearest you.

# CITIES SERVICE

## Welfare Fund Spends \$126 Million; Royalties Paid on 81.9% of Output

The UMWA welfare and Retirement Fund collected the royalty of 30¢ a ton on approximately 81.9% of the total bituminous production during its fiscal year ending June 30, 1952, according to the Fund's annual report for that period issued Aug. 14. During the year, the Fund spent \$126,338,269, providing benefits to some 257,949 beneficiaries. Its total income during the period was \$126,504,522, and as of June 30 it had a reserve balance of \$99,505,895, which was \$166,252 more than on the same date the year previously. Highlighted in the report were these facts:

**Royalties**—Revenue of \$125,734,819, at a rate of 30¢ a ton, indicated payments on 419,116,060 tons, about 81.9% of the total output of some 511,466,000

tons reported by the USBM for the period.

**Pensions**—Total payments for the fiscal year were \$51,762,639. As of June 30, 45,339 retired miners were receiving pensions, of which 8,139 had been authorized during the past year. The average of 678 pension authorizations per month was 31.7% below the monthly average for the previous fiscal year, though there had been no change in the eligibility requirements. The 1952 retirements and those previously reported show that actual retirements during the 5-yr period in which pensions have been paid were considerably below the actuarial estimates made originally, the report said.

**Retirement Ages**—Age of present pensioners at retirement was 63.2 yr, with

20.1% over 65. In service to the industry 78% had over 25 yr, 18.6% over 40 yr. Physical disability was given as the reason for retirement by 42%; laid off, 48%; and other reasons, 10%.

**Hospital and Medical Care**—Expenditures of \$49,996,518 provided 2,154,882 days of hospital and medical care for 215,372 beneficiaries.

**Rehabilitation and Maintenance Aid**—Payments of \$9,338,019 provided limited financial aid to 38,073 beneficiaries, totally disabled miners and their families. Of the 18,130 totally disabled miners receiving benefits, 21% were undergoing rehabilitation, while 79% were totally and permanently disabled.

**Other Payments**—Death benefits and widows and survivors cash benefits totaled \$11,704,531 and were made to 33,515 survivors of deceased miners. Cost of disaster benefits and field service was \$69,606. The Fund's administrative costs were \$3,466,955, or 2.7% of its total expenditures for the year.

## New Mine Developments

### Old Ben Mine No. 22 Resumes Operation After Modernization

Mine No. 22 of the Old Ben Coal Corp., the former Valier (Ill.) mine of the Valier Coal Co. acquired in 1948, resumed coal production early last month for the first time since August, 1949. Included in the modernization program for the property were the installation of all new cutting, drilling and loading machinery, mine cars, shuttle cars, replacement of the former rotary dump, sealing-off of old workings and construction of a new 9,200-tpd washery. The new plant, built by McNally Pittsburgh Mfg. Corp., uses the McNally-Tromp heavy-media process to prepare coal mined at No. 22 and other company properties and will operate on a two-shift basis. Seven loading units are expected to be used on both the day and night shifts at the mine, with about 200 men employed on each shift.

### Johnstown C.&C. Spending Half-Million at Beaver Run

Progress is being made toward completion of improvements at its Beaver Run mine, Beaverdale, Pa., the Johnstown Coal & Coke Co. announced last month. Involving an expenditure of some \$500,000, plans call for erection of a Roberts & Schaefer air-cleaning plant to be used in conjunction with the present wet-cleaning plant, installation of a new hoist for mainline haulage, an underground pumping station and two new circular shafts, one for ventilation and the other for use as a new portal. A new outside tramroad already has been completed. The new air-cleaning plant will guarantee the company a uniform product qualified for metallurgical purposes, thus offering it an opportunity of serving wider markets and a greater number of industries, company officials pointed out.

### Sterling Coal Reports Expansion Program

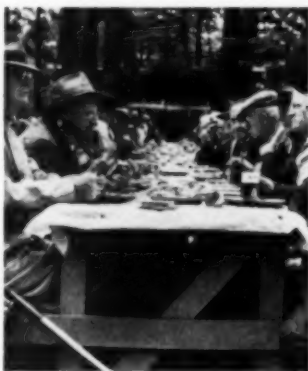
Some \$300,000 will be spent by the Sterling Coal Co., Bakerton, Pa., for the expansion and modernization of its properties, Dennis J. Keenan, general superintendent, recently announced. Included in the project is the sinking of a 442-ft shaft to be used both for ventilation and as an emergency escapeway, purchase of new mine cars and mine-car bodies, con-

struction of a combination machine shop, blacksmith shop and motor barn at Mine No. 1 and erection of a new oil and sand house near that mine.

### Massey Acquires Babcock Coal, Plans Million-Ton Output

The A. T. Massey Coal Co., Richmond, Va., last month reported purchase of the property, mine, tipples, coke ovens and equipment of the Babcock Coal & Coke Co. in Fayette County, West Virginia. The property will be operated by the Babcock Smokeless Coal Co. as the Bab-

(Continued on p 162)



### Lehigh Navigation Fetes 50-Yr Employees


THE 10TH ANNUAL OUTING of the Lehigh Navigation Coal Co.'s Old Timers Club held last month at the company's Greenwood Lake near Lansford, Pa., drew more than 200 of the 269 veterans despite a steady rain that lasted most of the day. Highlight of this and all former outings came at lunch when the Old Timers sat down at long picnic tables and waited to be



served by a corps of waiters made up of company supervisory personnel led by Evan Evans (right), president. Members of the club, which is restricted to workers with 50 or more years of service, range in age from 64 to 87 yr, and 82 still are actively employed. In ceremonies following lunch, Mr. Evans welcomed 21 new members into the organization.



# THESE ROOF-BOLTING STOPERS GET THE JOB DONE FASTER and CHEAPER



**JOY SAL-37T**  
TELESCOPIC FEED—LONG  
STEEL CHANGES—LIGHTWEIGHT  
LOW AIR CONSUMPTION



**JOY SAE-91T**  
TELESCOPIC FEED—LONG  
STEEL CHANGES—SHORT  
OVERALL LENGTH—HEAVY DUTY

You can cut your roof-bolting costs away down with Joy Stopers . . . with constant-pressure telescopic feed and centralized control.

In the first place, the long steel changes that Joy Drills afford mean fewer steel changes for your roof-bolters and more time spent in actually drilling . . . more hole footage per shift. What's more, fewer steel sizes need be carried in stock and hauled to the face.

In the second place, Joy Stopers have several exclusive features: such as cadmium-plating inside and out for rust-protection, closer tolerances and easier run-ins . . . and the famous Dual Valve that "makes air do more work". These features make for greater efficiency, longer service life and less maintenance.

Joy builds a complete line of roof-bolting equipment—air-operated or hydraulic. • Call on us for details . . . Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.

## SPECIFICATIONS

	SAL-37T	SAE-91T
Steel Changes	30" 36" 42"	30" 36" 42" 48"
Weight	63# 65# 67#	98# 103# 106# 109#
Collapsed Length	25" 28" 31"	23 $\frac{1}{4}$ " 29 $\frac{3}{8}$ " 32 $\frac{1}{2}$ " 35 $\frac{1}{8}$ "
Extended Length	61" 70" 79"	57 $\frac{1}{2}$ " 73 $\frac{1}{8}$ " 82 $\frac{1}{8}$ " 91 $\frac{1}{8}$ "

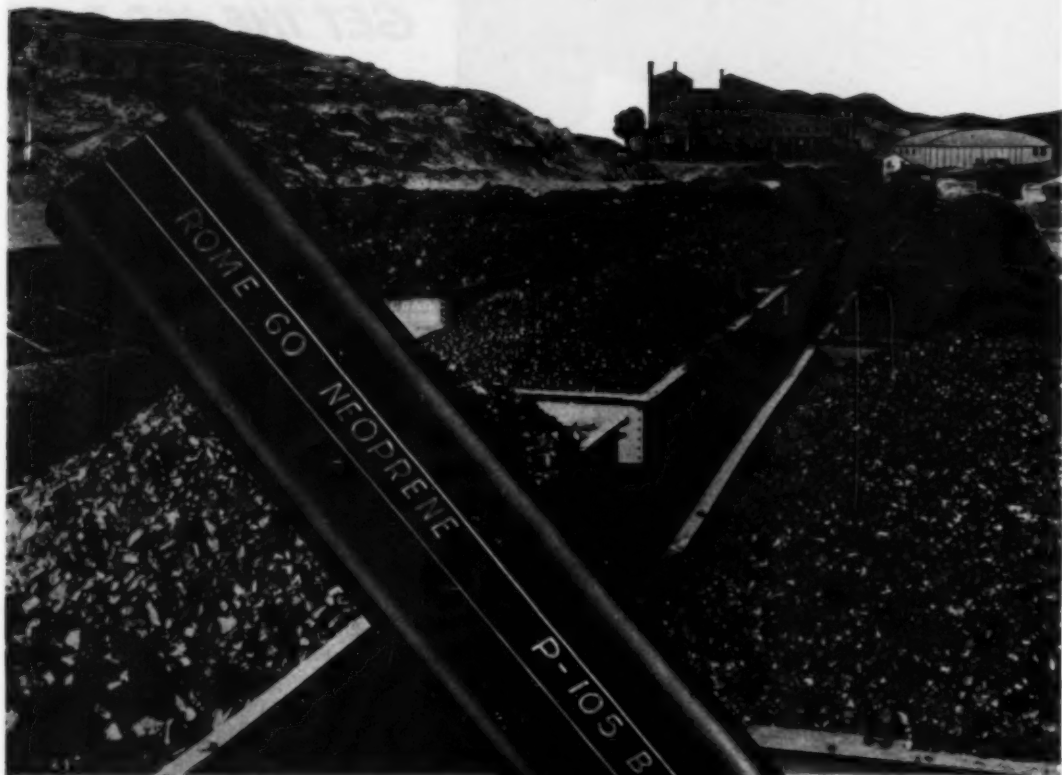


*Consult a Joy Engineer*

# JOY

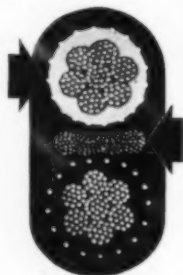
**YOU CAN DEPEND ON**

# **Rome 60 Mining Cables**



"P-105 BM" molded in the Neoprene sheath is your assurance of compliance with Federal and Pennsylvania Safety Codes.

• The open braid around each conductor firmly interlocks conductors to sheath . . . prevents twisting, loosening and pulling.



The grounding conductor, solidly embedded in a Neoprene web, gives exceptional protection against "shorts" and mechanical injury . . . yet maintains flexibility and minimizes conductor distortion and fatigue.

# to keep production up Interlocking braid

**prevents failure from twisting, bending or pulling of conductors**

Now, more than ever, it is essential to keep production at a maximum. With costs spiraling, "down time" grows increasingly expensive. Yet, tens of thousands of dollars worth of equipment standing idle and costly man hours wasted are often the result of a single cable failure. That's where the extra quality of Rome 60 Mining Cables pays off.

With Rome 60 Mining Cables you don't have to worry about conductors twisting, pulling or loosening within the Neoprene sheath. A long-time feature of Rome 60 is a reinforcing braid interlocking . . . actually "gearing" individual conductors to the sheath and providing 360 degrees of balanced adhesion. Further, this open braid construction does not reduce sheath thickness . . . does not create thin spots.

Rome 60 Flat Twin (Parallel Duplex), Type G, for shuttle car serv-

ice, features a Neoprene webbing between power and grounding conductors, which unlike fibrous components, cannot rot, deteriorate or wick moisture. Note the integrated construction of the cable illustrated. The resiliency of Neoprene, compared with fibrous materials, provides higher impact resistance, as well as increased protection against short circuits. The absence of restraining fibrous "separators" results in maximum flexibility for fast reeling applications.

All Rome 60 Mining Cables are insulated with a special heat-resistant rubber compound suitable for operation at 75° C., thereby providing extra overload protection.

The Neoprene sheath is molded to a tire-like toughness. It is highly resistant to acids, alkalis, oils, abrasion and flame. *It is made for long and tough service.*

**A Wide Selection of Tough,  
Dependable Rome 60 Mining  
Cords and Cables:**

- Type SO Portable Cords
- Single Conductor Locomotive Cables
- Concentric Mining Machine Cables
- Flat Twin (Parallel Duplex) Mining Machine Cables—Types W and G
- Multiple Conductor Portable Power Cables—Types W and G
- Shot Firing Cord
- Mine Power Distribution Cable
- Shovel and Dredge Cables

**IT COSTS LESS TO BUY THE BEST**





**PLANTING AND PROSPECTING**—Dr. G. E. Davis (left), director, Div. of Adult Education, Purdue; Cecil M. Guthrie, general superintendent, Sinclair Coal Co.; Dr. Judson Meade, geophysicist, Indiana Univ.; Daniel DenUyl, associate professor of forestry, Purdue; and George J. Reynolds, Western-Knapp Engineering Co., retiring president.

**LIGHTING, ALUMINUM, MAGNETIC AMPLIFIERS**—W. D. Richards (left), lighting engineer, Lighting Institute; R. R. Cope, director, sales development, Aluminum Co. of America; and R. W. Moore, manager, control development engineering department, Westinghouse Electric Corp.

## Open-Pit Electrical Division Meets

**Geophysical surveying, experimental planting, better lighting, aluminum in electrical distribution and construction and magnetic amplifiers major themes at 8th annual electrical engineers' meeting.**

REPORTS on the growth and propagation of trees planted on spoil banks since 1926, geophysical methods for surveying coal properties, the features required in a good industrial lighting system, the advantages of aluminum in transmission and precautions to be observed in its use, and the advantages and disadvantages of magnetic amplifiers in the fields now served by rotating controls were topics presented by speakers at the 8th annual meeting of the electrical division of the Open-Pit Mining Association at Purdue University, Lafayette, Ind., July 25.

Over 115 electrical engineers and chief electricians from coal- and iron-mining regions in attendance also saw motion pictures describing the use of belt conveyors in surface mines and the installation and maintenance of aluminum line materials, and witnessed a high-voltage demonstration at Purdue's electrical engineering laboratory directed by Prof. C. F. Sprague of the electrical-engineering faculty.

At the banquet in the evening, officers for the coming year were elected as follows: president, Charles E. Crawford, chief electrician, Midland Electric Coal Corp., Farmersville, Ill.; vice president, Frank Bohann, electrical engineer, The M. A. Hanna Co., Hibbing, Minn.; secretary-treasurer, L. E. Briscoe, electrical engineer, Fairview Collieries Corp.,

Indianapolis, Ind. George J. Reynolds, Western-Knapp Engineering Co., retiring president, was elected to the board of directors.

At the morning session, speakers and their subjects were Daniel DenUyl, associate professor of forestry, Purdue, "Experimental Tree Planting on Spoil Banks," and Dr. Judson Meade, geophysicist, Indiana University, Bloomington, Ind., "The Use of Geophysics in the Search for Coal." The conferees were welcomed to the campus by Dr. George E. Davis, director, adult education division, Purdue. C. M. Guthrie, general superintendent, Huntsville-Sinclair Mining Co., Kansas City, Mo., presided.

### EVALUATING REFORESTATION

Using photographic slides to show the progress of reforestation on stripped lands, Mr. DenUyl pointed out that only now is it becoming possible to evaluate the results of many past planting experiences because of the years intervening between planting and measurable results with regard to propagation and yield. This experience shows that some

ideas, such as the value of black walnut trees and the importance of the pH of the upturned soil, may have to be revised, Mr. DenUyl declared. In Indiana, black walnut does not seem to thrive as well as some other species, and pH does not govern to the extent formerly thought probable.

In listing species that survive on mid-western spoil banks, Mr. DenUyl named green ash, sycamore, cottonwood, red and silver maple and sweetgum. However, hardwood seedlings may have a hard time competing with sweet clover if the latter is planted at the same time. When nature's aid is desired in propagation, the confers might be used, Mr. DenUyl said.

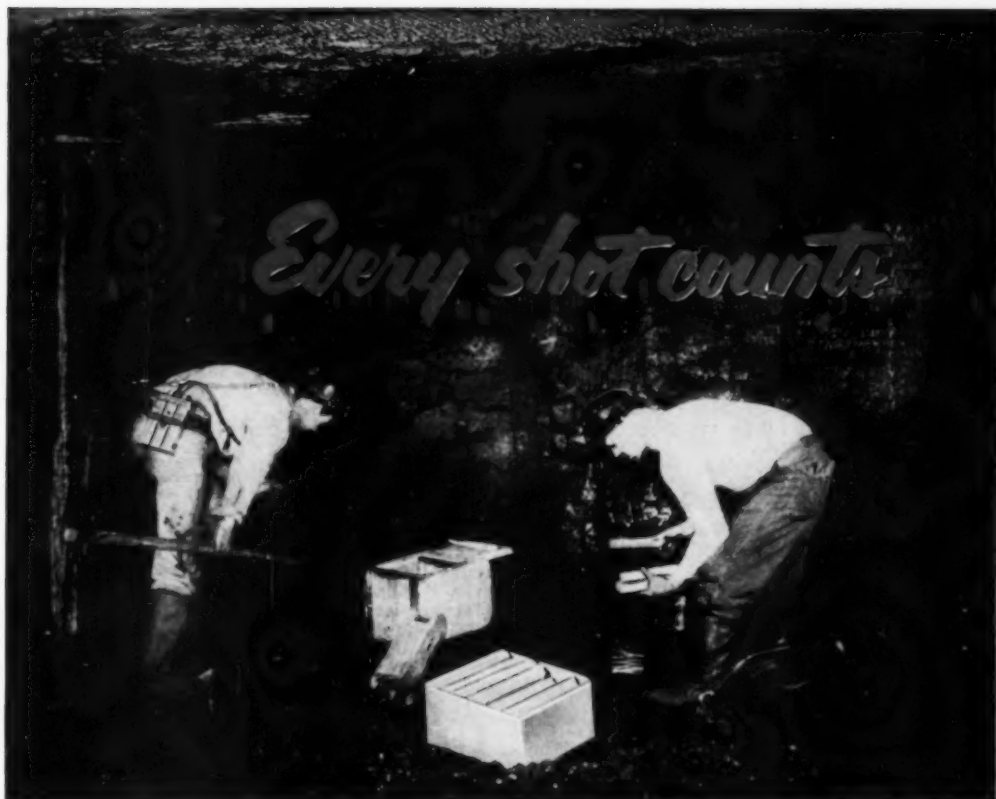
In regard to the value of planting on spoil banks, Mr. DenUyl pointed out that the lakes and recreation areas that sometimes result make the planting projects worthwhile.

### GEOPHYSICAL PROSPECTING

The value of geophysical prospecting methods on coal lands will come from being able to determine where coal is not to be found, Dr. Meade said, in pointing out that the general lay of a coal seam may be determined by drilling and geologic inference drawn from outcrop data, but that faults and "buried valleys" would be detected by geophysical surveying. Knowing where these barren areas lie often has a heavy bearing on the plans finally drawn for removal of the coal.

Since the search for minerals by these methods depends upon taking advantage of differences in physical constants of the various materials, it is necessary to quantitatively evaluate the physical constants of coal, and Indiana University research efforts are aimed at that goal,

**INDUSTRY MEETING—  
A Special COAL AGE  
Staff-Written Report**



when you use



**With each shot, American Explosives help to give you:  
Excellent breakage • Uniform results • Low cost operation**

There is a complete line of densities and velocities suitable for producing good results in any seam of coal—with either hand or mechanical loading.

For prompt delivery of these reliable explosives, contact any one of several plants and distributing magazines conveniently located in strategic areas... *make your next order American.*

*Capable Field Engineers are Available at Your Call*

**High Explosives • Permissibles • Blasting Powder • Blasting Accessories**

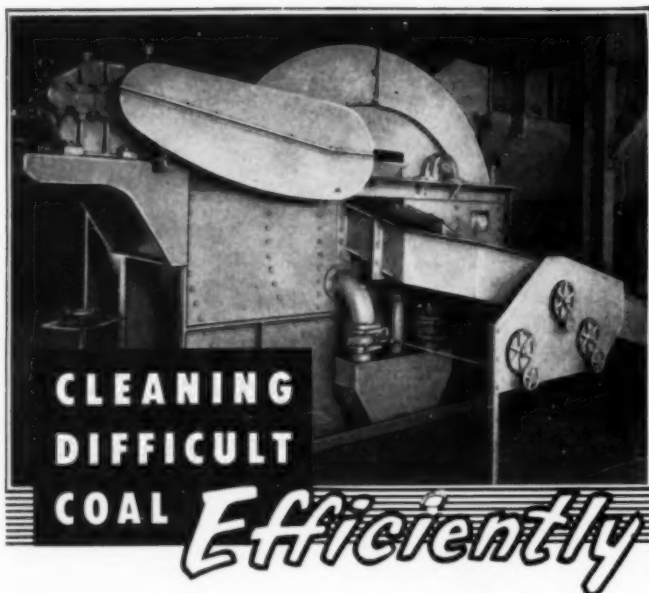
**AMERICAN *Cyanamid* COMPANY**

*Explosives Department*

30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

Sales Offices: Pittsburgh, Pa., Bluefield, W. Va., Scranton, Pa.  
Chicago, Ill., Pottsville, Pa., Maynard, Mass.





If you are experiencing difficulty cleaning your coal efficiently, then investigate the NELDCO Dense Media Coal Cleaning System. Washeries in this country and in Europe are enjoying the benefits of higher yields of suitable clean coal from the run-of-mine product, simpler plant operating conditions, the inherent adaptability to changes in the quality of raw coal mined without the impairment of standards for clean coal quality.

#### STANDARDIZED PLANTS 50 TO 325 TONS PER HOUR

Standardized Coal Cleaning Plants in six sizes—capacities 50 to 325 tons per hour. Send for Book No. 152.

#### CUSTOM-BUILT PLANTS ANY SIZE — ANY CAPACITY

If you prefer a custom-built plant we can design and build an operation to suit your specific requirements.

Let us show you how the NELDCO Dense Media System will clean coal within any size range between 10" and 1/4", eliminate hand-picking, make your coal a better product and get a better market price.

Whether you produce a small or large volume of coal we shall be very glad to tell you more about the NELDCO System.



## NELSON L. DAVIS COMPANY

DESIGNERS AND BUILDERS OF COAL CLEANING PLANTS  
USING THE DENSE MEDIA PROCESS

343 SO. DEARBORN ST., • CHICAGO 4, ILLINOIS

### COMING MEETINGS

American Retail Coal Association: 17th annual convention, Sept. 16-17, Morrison Hotel, Chicago.

Central Pennsylvania Coal Producers' Association: annual meeting, Oct. 2-3, Bedford Springs Hotel, Bedford, Pa.

National Safety Congress: 40th annual meeting, Oct. 20-24, Conrad Hilton, Congress, Morrison and Sheraton Hotels, Chicago, Ill.

Illinois Mining Institute: 60th annual meeting, Oct. 24, Hotel Abraham Lincoln, Springfield, Ill.

National Coal Association: annual convention, Nov. 10-12, Waldorf-Astoria Hotel, New York.

Dr. Meade reported. It is now known that resistivity is high, so there is hope of being able to use electrical methods to identify coal among other under-the-surface materials. Also, coal's elasticity differs from that of associated rock strata, thus making seismographic methods attractive. The latter method holds promise of providing fast, low-cost surveys of coal properties. Furthermore, the need for drilling is eliminated and the surveying can be done by normally intelligent men after only short training.

Concluding feature of the morning program was a demonstration in the high-voltage laboratory showing the effects of lightning on arresters and on protected and unprotected buildings.

At the afternoon session, speakers and their topics were: W. D. Richards, lighting engineer, Lighting Institute, Chicago, Ill., "Protective Lighting"; R. R. Cope, director, sales development, Aluminum Co. of America, Pittsburgh, "Application of Aluminum for Electrical Conductor Purposes"; and R. W. Moore, manager, control engineering development department, Westinghouse Electric Corp., Buffalo, N. Y., "Application of Magnetic Amplifiers."

### HOW GOOD LIGHTING PAYS

High employee morale, fewer accidents and better work are direct benefits of good lighting. Mr. Richards declared, in pointing out some basic lighting considerations, as follows:

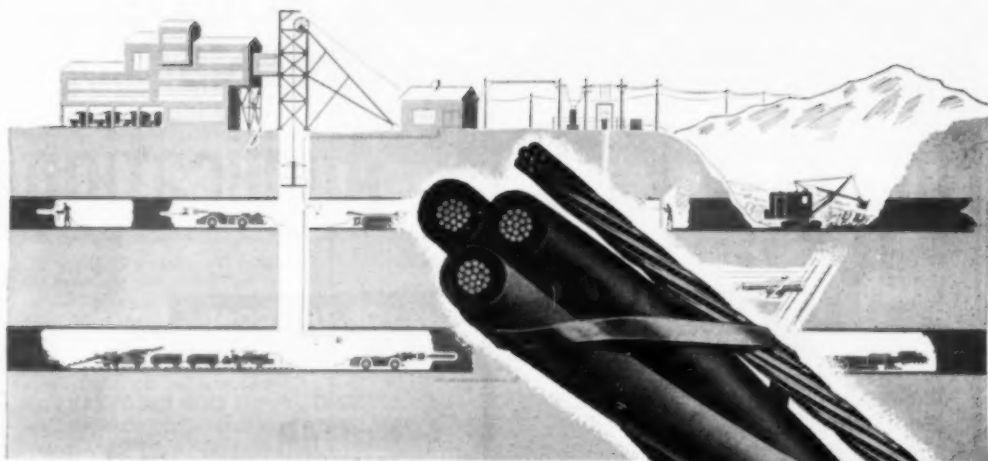
1. Sufficient light of good quality should be provided at the point where the work is done. This is especially true in mining and stripping, where visual tasks are difficult because of the lack of contrast.

2. Even distribution of light at effective levels of illumination permits flexibility in laying out work.

3. Prevention of glare, direct or reflected, contributes to discomfort and speeds physical fatigue.

4. Provisions at installation time for constant maintenance of the system keeps the level of illumination as close as possible to original values.

For lighting the face area in a strip



***safe ... compact ...***

***low cost ... easy to install ...***

## **HAZARD SELF-SUPPORTING CABLE FOR POWER TRANSMISSION**

Versatile...that's Hazard-Self Supporting Cable for power transmission in and around the mine. Its "all-in-one" construction (pre-assembled cable, messenger and binder) requires a minimum of space, makes it easy and quick to install...simple to relocate. And it can be furnished with Hazard's reverse-lay design which permits spreading of the conductors for easy tapping anywhere along the cable.

Because of these advantages, it is an ideal cable for overhead suspensions between buildings and shaft structures, carrying power through heavily wooded areas, and for side wall or roof suspensions in underground slopes and entries. For all power transmission lines, Hazard Self-Supporting Cable is engineered and constructed to give extra long life under

the severest mine operating conditions.

Hazard Self-Supporting Cable is insulated with Watertite heat and moisture resistant insulation and protected by Hazard's famous Hazaprene ZBF sheath. This smooth, abrasion-resistant covering possesses maximum density and lasting toughness to stand up against weather and destructive mine water. In addition, Hazaprene ZBF sheath more than meets the requirements of the Federal Bureau of Mines and the Pennsylvania Department of Mines for flame resistance.

For complete information on this versatile power transmission cable see your Hazard representative or write Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

# **HAZARD**



# ALLIS-CHALMERS BUILDS VIBRATING SCREENS For ***ANY*** Coal Application!

AND BUILDS MORE SCREENS FOR THE COAL  
INDUSTRY THAN ANY OTHER MANUFACTURER!

## RUN-OF-MINE SCALPING

Extra Heavy Duty

### **RIPL-FLO SCREEN**

A heavily constructed 2-bearing inclined screen for scalping ROM ahead of picking tables or crushers. Floor mounted or suspended. 4x10 to 6x16 ft.



## DEWATERING . . . SLUDGE RECOVERY

### **LOW-HEAD SCREEN**

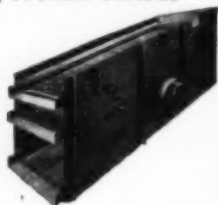
Horizontally operating Low-Head screens are widely used for primary and secondary dewatering . . . and for the recovery of saleable coal from sludge. 3x12 to 6x16 ft. Send for Bulletin 07B6330A.



## SIZING TO EGG, NUT, STOKER GRADES

### **RIPL-FLO SCREEN**

Used for wet or dry screening of raw coal ahead of washers . . . for preparing egg, nut, stoker sizes . . . for grading and rescreening crushed coal. Sizes 3x6 to 6x16 ft. Send for Bulletin 07B6151B.



## MEDIA RECOVERY

### **LOW-HEAD SCREEN**

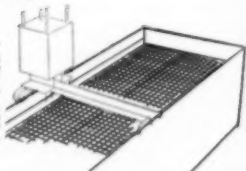
Low-Head screens are used as media drain and wash screens for coal and refuse. Available with movable partitions to handle both products. 3x6 to 6x16 ft.



## SIZING FINE MOIST COAL

### **THERMO-DECK HEATING UNIT**

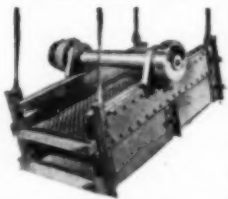
Low voltage resistance heating of wire cloth eliminates troublesome blinding of moist fine coal. No downtime to clear the screen. Can be installed on A-C screens now in use. Bulletin 07B7812.



## AUXILIARY SIZING AND DEWATERING

### **AERO-VIBE SCREEN**

Used for sizing coal or middlings following air cleaner, sludge dewatering, dewatering following chloride washer. Easy to install and operate. 2x4 to 5x10 ft. Send for Bulletin 07B6099.



Low-Head, Rip-Flo, Aero-Vibe, Thermo-Deck, Texrope are Allis-Chalmers trademarks.

A-3723

# ALLIS-CHALMERS

## OTHER ALLIS-CHALMERS PRODUCTS FOR COAL

Texrope V-belt drives . . . Motors and Gearmotors . . . Multi-Stage Mine Pumps . . . CW Solids-Handling Pumps . . . Rubber-Lined Pumps . . . Unit Substations . . . Transformers . . . Car Shakers . . . Complete Power Generation, Distribution and Control Equipment.

MILWAUKEE 1,  
WISCONSIN



#### EQUIPMENT APPROVALS

Six approvals of permissible equipment were issued by the U. S. Bureau of Mines in July, as follows:

Lee-Norse Co.—Type RJ5-2K utility truck; one 5-hp and one 3-hp motor, 250 v, DC; Approval 2-866; July 2.

Goodman Mfg. Co.—Type RMT tractor-tread truck; one 10-hp motor, 440 v, AC; Approval 2-867A; July 7.

Joy Mfg. Co.—Type 3JCM-2BH continuous miner; two 65-hp, one 10-hp, two 7½-hp and two 3-hp motors, 440 v, AC; Approval 2-868A; July 16.

Joy Mfg. Co.—Type 32E16/PX-1 cable-reel shuttle car; three 7½-hp motors, 250 v, DC; Approval 2-869; July 21.

Joy Mfg. Co.—Type 12BU-10E loading machine; five 4-hp motors, 250 v, DC; Approval 2-870; July 31.

Baker-Rauland Co.—Type YE36 and 48 battery-powered "Trike"; one 3-hp motor, 20 v, DC; Approval 2-871; July 31.

mine, Mr. Richards suggested that lamps be installed on the lower frame of the shovel or dragline to limit the vibration which ruins incandescent-lamp filaments. Furthermore, if steady voltage is available, mercury-vapor lamps are recommended for their brighter light and higher resistance to vibration. They must be installed for single-position operation, Mr. Richards pointed out.

Sodium-vapor lamps are especially valuable where dust or fog interfere with the work, because this type light has high penetrating power.

In tipples and cleaning plants, mercury-vapor lighting is useful over picking tables because it best shows the difference between refuse and coal. Men who see better work better, Mr. Richards concluded.

#### USING ALUMINUM CABLE

Over 2,000,000 mi of aluminum cable now is in use in the United States as a current-conducting medium, Mr. Cope reported, in pointing out that the use of aluminum in this service goes back about 50 yr. The use of aluminum as bus conductors goes back to 1896 when a large quantity of flat bar was used for the 600-v 60,000-amp bus at a Niagara Falls plant. The installation was still in use when the plant was taken out of service 3 yr ago, Mr. Cope said, in describing the service life that can be expected from aluminum.

Among the economic advantages which make aluminum suitable for this service are light weight, corrosion resistance, high electrical and heat conductivity, good workability, non-sparking and non-magnetic properties, high alloy strength, good appearance and high scrap value. The light weight of aluminum cable makes available the economies inherent in transmission lines that will hang on

## Safe! Dependable! MINE TRANSPORTATION



The TJI Mine Jeep provides safer, faster underground transportation for Mine Superintendents, Engineers, Inspectors, and Maintenance Personnel to and from working faces and emergency areas. Its many applications include pulling man-trip cars, fire-fighting equipment, and conversion to ambulance duty at a moment's notice.

The Lee-Norse TJI Mine Jeep is a much-needed vehicle in your underground transportation system! Write today for details.

## Now! ½ the Size... ½ the Cost LEE-NORSE SCOOTER



A NEW, SPEEDY  
MINE PERSONNEL  
CARRIER

Quick, independent transportation for Mine Mechanics, Pumpers, Fire Bosses, and other maintenance personnel at one-half the cost with the Lee-Norse Scooter! Approximately one-half the size of the Mine Jeep, the Lee-Norse Scooter is rugged and simple in design, incorporating many standard Mine Jeep parts. Weight—approximately 1000 lbs.; Wheel Base—48"; Overall Length—8'4"; available in all track gauges, 36" to 48". Headlights available at slight additional cost.

The Lee-Norse Scooter provides low-cost, run-about transportation when and where it is needed! Write today for complete information.

**Lee-Norse Company**  
CHARLENOI, PA.

*All over the nation*



# PETERSON

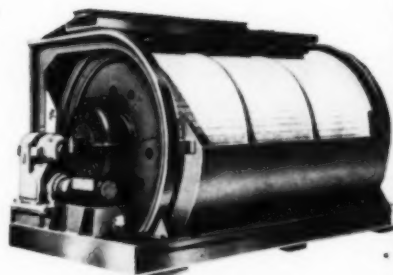
## TFR *and* DISC VACUUM

### FILTER INSTALLATIONS

During the last ten years a rapidly growing number of coal and metallurgical engineers have been turning their TOUGH FILTRATION and DEWATERING problems over to Peterson. They have learned that Peterson's engineering know-how, gained through 37 years of filtration experience, produces filter equipment to fit their exact needs.

That's why the installation map of this relatively new — but thoroughly seasoned firm of filtration specialists, is always out of date. Tough problems continue to arise and Peterson solves them.

If you want dry, fluffy cake from your coal fines — the lowest moisture with minimum degradation, get in touch with Peterson today. There is no obligation, but you'll start saving money when you take advantage of Peterson's experience.



**PETERSON FILTERS & ENGINEERING CO.**

Office and Laboratories: 137 MOTOR AVE., SALT LAKE CITY 1, UTAH

**37 YEARS OF INDUSTRIAL FILTRATION EXPERIENCE IS AT YOUR DISPOSAL FOR THE BEST IN FILTER INSTALLATIONS**



longer spans, thus reducing the number of towers or other supports required.

Special care in making connections is required, Mr. Cope cautioned, if tight low-resistance joints are to result. There are available, however, special fluxes and anti-corrosion compounds which, when properly used, will insure a sound electrical joint.

In view of the relative availability of copper and aluminum and their price relationship, Mr. Cope said he looks forward to spreading use of aluminum in electrical uses. In fact, some manufacturers are working at designing motors with aluminum coils, although such motors would not carry power ratings as high as copper-wound units of the same size.

#### NEW-TYPE REGULATOR

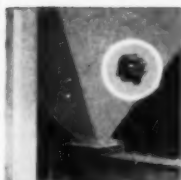
The magnetic amplifier, a saturable-core transformer, is a new entry in field now served by regulating units such as rotating controls and vacuum-tube regulators, Mr. Moore said, in describing industrial applications of these units which have no moving parts and are strong enough to withstand the shock and vibration of heavy-duty service. While extensive field tests would have to be made to determine their usefulness on shovels and draglines, Mr. Moore declared, such tests might show that a current-limiting magnetic amplifier, added to the presently used rotating controls, could permit obtaining greater peak power and faster operating speeds while limiting the stresses in the drive equipment.

Capable of fast response in correcting control errors, magnetic amplifiers now are finding increasing acceptance in the steel and paper industries, and it is likely that further study and improvements will make them valuable to the mining industry for controlling hoists and stripping equipment.

### SAFETY MILESTONES

#### 15-Yr Fatality-Free Record

More than 300 mineworkers, mine officials and their families attended the annual miners' picnic held by UMWA Local 6349, Bellingham (Wash.) mine, Bellingham Coal Mines Co. Main event of the program was the presentation of a Joseph A. Holmes Safety Association Certificate of Honor to Bellingham No. 1 mine "for operating without a fatality from April 20, 1937, to Nov. 1, 1951, when the mine closed, with an average of 180 employees, producing 2,325,326 tons of coal." In presenting the certificate to James H. Pascoe, vice president and superintendent, and Carl Omli, Local president, L. H. McGuire, chief, Accident Prevention and Health Div., USRM Region II, cited the close cooperation between management and labor and pointed out that it was the only mine in the four-state area of Montana, Idaho, Washington and Oregon to receive such an award during 1952. The record is even more remarkable, Mr. McGuire pointed out, in that the tonnage was produced over a 15-year period under adverse conditions on a contract basis by indi-



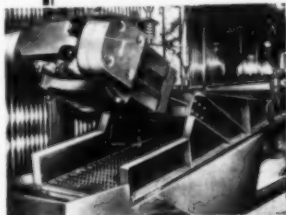
ELECTRIC VIBRATORS



VIBRATORY FEEDERS



VIBRATING GRIZZLIES



VIBRATING SCREENS



VIBRATING PICKING TABLES

Write Today for Your FREE Copy of any of the—  
Syntron Material Handling Equipment—Illustrated Catalog Folders

## What's Your Problem?

Clogged bins and hoppers? Slow, unreliable, uncontrolled material feed? Lack of sizing or separation? Poor hand picking conditions?

Then ask about—

## SYNTRON

Electric Vibrators, promoting free-flowing bins, hoppers and chutes.

Vibratory Feeders, controlling the flow of materials at variable rates.

Vibrating Grizzlies, feeding and coarse sizing simultaneously.

Vibrating Screens, removing foreign objects, lumps... from the volume flow.

Vibrating Picking Tables, increasing the efficiency of hand picking.

**SYNTRON COMPANY**  
975 Lexington      Homestead, Pa.

**For Maximum Safety, Dependability**

**in Mine Roof Support**

**always specify**

# DUFF-NORTON MINE ROOF JACKS

Duff-Norton Mine Roof Jacks . . . jack fittings . . . angle jacks and pin timbering jacks are your best choice for all mine roof supporting jobs. Their sturdy construction combines safety and dependability with economy. To specify the *right jacks* for your needs . . .

Write today for your copy of this Handy Guide for selecting all types of Mine Jacks.



**See your Local Distributor**

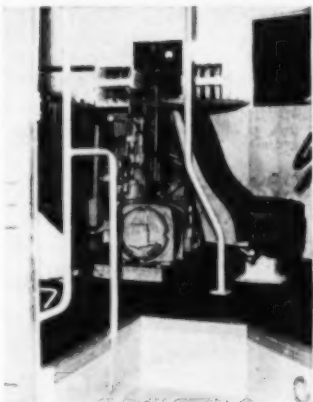
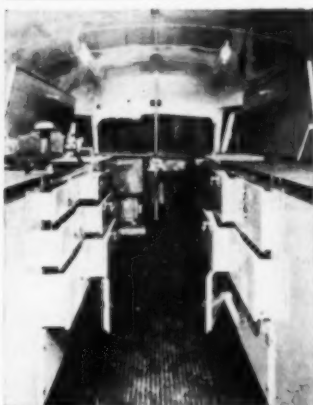
**THE DUFF-NORTON MANUFACTURING CO.**

MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA. — CANADIAN PLANT, TORONTO, ONT.

*"The House that Jacks Built"*



vidual mineworkers. Other speakers included W. J. Evans, chief coal-mine inspector, State of Washington; Mr. Omli; John Shoemaker, past president of the Local; Arthur Rhinehart, secretary, Local 6349; John E. Pasquan, mine foreman for the new company; and Mr. Pascoe. Barbecued salmon and refreshments were furnished by the union.



## New Safety Truck For Illinois Department

**ROOMY INTERIOR** (top) of the newest MSA "Mobile Safety Station" obtained by the Illinois Department of Mines and Minerals features built-in cabinets and compartments, non-skid flooring and modern lighting. The unit is mounted on a specially built, school-bus-type body designed to permit rescue teams to work without stooping. Other features shown in the cab view (bottom) are the motor-driven oxygen pump, directly behind the driver's seat, for replenishing portable apparatus from tanks underneath the main body, and the charging rack (above the pump against the wall) for recharging cap-lamp batteries.



## Nothing too rough or tough for Thermoid Conveyor Belting

Thermoid's long experience and continuing research *in the field*, pays off with real economy, maximum efficiency and greater tonnage for your belting dollar. Regardless of the size or kind of material—light or heavy, soft or abrasive, hot or cold, wet or dry—whatever the job, it's a good bet that Thermoid has solved the same or a similar problem with a belt that will do the job better.

In most cases, your Thermoid distributor can select the belt that will serve your needs most economically. Where unusual conditions exist, he will call in an experienced Thermoid sales engineer.

Get in touch with your Thermoid distributor or write direct for a copy of the Thermoid Conveyor Belting Catalog No. 3679.

*It will pay you to specify Thermoid*



Conveyor & Elevator Belting • Transmission Belting  
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

# Thermoid

Rubber Sheet Packings • Molded Products  
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

## DEPENDABLE HEATING

FOR ALL TYPES OF  
MINE BUILDINGS

**E. K.  
Campbell Co.**  
LARGE SPACE  
HEATING EQUIP.  
K.C., Mo.



*Economical*  
**FURNACE FAN SYSTEM  
KEEPS PRODUCTION  
MOVING IN THE COLDEST  
WEATHER!**

- Low initial cost—Low maintenance cost!
- No water used.
- Design flexibility permits tailored application.
- Automatic controls—minimum attention required.
- Heavy duty equipment—long life with hard usage.

For Complete  
Information  
Write:

E. K. Campbell Company,  
Manchester Avenue at 18th Street,  
Kansas City 3, Missouri

Building \_\_\_\_\_  
Size \_\_\_\_\_ Type \_\_\_\_\_  
Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_



### Amherst Coal Officials Cited

RECOGNITION of the outstanding safety records achieved by the five mines of the Amherst Coal Co., the one mine of the Hatfield Campbell Creek Co. and by their operating officials featured the annual safety dinner held by the two firms at Accoville, W. Va., earlier this summer. Officials presented with Certificates of Honor of the Joseph A. Holmes Safety Association for achievements of their mines were: T. E. Mitchem (left, above), superintendent Point Lick No. 4 mine, Hatfield Campbell Creek; Jess Trent, assistant superintendent, and Roy Castle, general mine foreman, Amherst No. 1-B mine; Cecil Edwards, general mine foreman; Amherst 1-C; W. T. Chaney, former superintendent, Amherst's Lundale mine; Russell Ward, general mine foreman, Amherst 1-A; W. B. Hayes, general superintendent, Amherst Nos. 1 and 3 mines; and K. P. Marcum, general mine foreman, Amherst 3-A. Messrs. Castle and Hayes also received Holmes Certificates for their personal supervision records.



SUPERVISORY STAFF of Amherst Coal's No. 1-B mine who received a Holmes award for producing more than 2,000,000 tons without a fatality included: Leonard Butcher (seated, left), transportation foreman; Clyde Gibson, conveyor foreman; Roy Castle, general mine foreman; Homer Copley, conveyor foreman; Herbert E. Jones, Jr. (standing, left), vice president in charge of operations for all Amherst Coal properties; Frank Duya, conveyor foreman; and Paul Basham, rock foreman.

MINE SUPERVISORS who were presented with National Coal Association awards for their 1951 safety records were: Challis Workman (seated, left), mobile-loader foreman, MacGregor No. 1 mine; Gaither Knight, night foreman, Amherst 3-A; Wayne Brumfield, Thomas E. Johnson and David Sealf, conveyor foremen, MacGregor No. 2; Harry Gandy (standing, left), executive representative, NCA, who made the presentation; G. A. Cooper, general outside foreman; Paragon mine; Guy V. Black, night foreman, Avon mine; Harvey B. Porter, general outside foreman, Amherst No. 3; Roy Copley, timber and slate foreman, MacGregor No. 2; and Pat Jeffrey, general assistant foreman, MacGregor No. 6.





**"We're proud of our  
Coal Preparation Plant ...**

***...it's FAIRMONT-BUILT !!!***

**EFFICIENT OPERATION**

Records from mine after mine show  
99%+ separating efficiency!

**LOWEST OPERATING COSTS**

Production records show cost per ton of coal cleaned  
to be consistently lower than any other system!

**EXTRA WIDE SIZE RANGE**

1/4" to 10"—PLUS ability to handle coal at operating  
gravities from 1.35 to 1.65. Washing gravity change-  
over on Chance Sand Flotation system can be made in  
five minutes by one man.

"Fairmont-Built" *GUARANTEED* plants can be designed in sizes  
ranging from 40 tons per hour to 800 tons per hour. For help or  
advice on your coal preparation problems, call on the FAIRMONT  
ENGINEERS.

**FAIRMONT MACHINERY COMPANY**

**Fairmont, West Virginia**

Designers and Constructors of Chance Sand Flotation Process for  
Wet Cleaning and American Pneumatic Separator for Dry Cleaning



**"FAIRMONT-BUILT"**



# MCCARTHY NEW COAL RECOVERY DRILL

36-INCH DIAMETER AUGERS,  
24 FEET LONG

## BIG PROFITS

*Small Investment—Low Overhead . . .*

• You trace rich coal deposits in unmined, abandoned, high-wall strip mines for money in the bank when you put the new McCarthy sugar machine to work.

You gain many thousands of tons of coal in the course of a year because the McCarthy machine is designed for quick, easy transportation from one hole to the next—and no bulldozer is required to move it. The new McCarthy sugar machine is self-propelling.

With an output of about 80 tons an hour, a three-man crew, low maintenance and low amortization costs from smaller initial investment, the profit per ton is top dollar.



*Field test near Cadiz, Ohio*

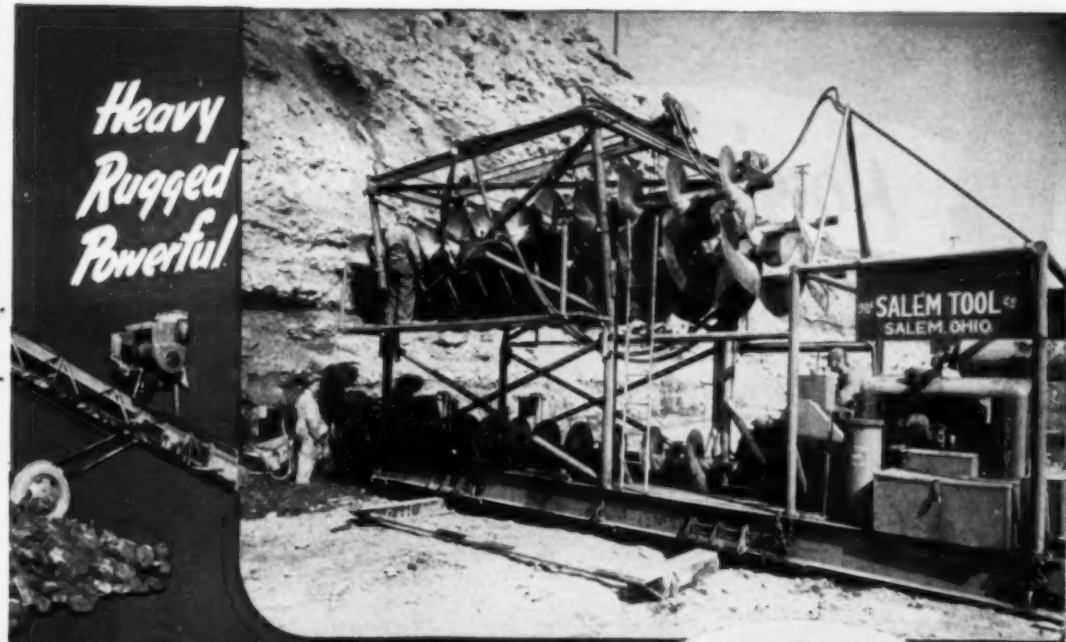
• Conveyor extension under sugar clearly picks up exposed coal, and boosts it to 35-foot truck loading conveyor. For ease in portability of all equipment from one strip mine to the next, conveyors are detached from sugar machines.

*Clean pickup by conveyor*

• Mr. McCarthy, Engineering Field Representative, states: "In spite of a 2-inch hard parting about midway of the seam, cutting speeds averaged up to 3 feet per minute."



*Heavy  
Rugged  
Powerful*



• New McCarthy tool auger. From 100 to 300 feet per day. Drills 18-inch holes; 6 1/2-inch outside pilot head, tungsten-carbide barrel bits produce large round holes.

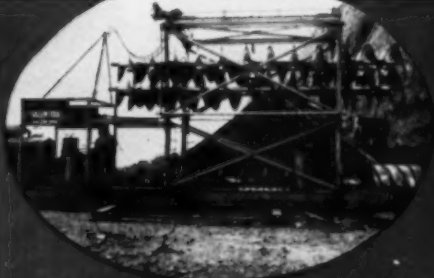
#### DESIGNED WITH YOUR PROBLEMS IN MIND

Time lost in transportation . . . and on the job inflates overhead costs and skims cream from profits. As well as high output, The Salem Tool Company has built rapid maneuverability into the design of the new McCarthy drill. The entire auger carriage assembly is easily unbolted and disassembled into sections convenient to handle. Conveyors are moved by the drilling machine as it advances to successive holes. For highway travel conveyors are disconnected and the machine lifts itself to a height of 3 feet on its hydraulic jacks to allow truck tractor bed to roll under. Short 32-foot length and 8-foot width permit convenient and allowable highway movement.

In the strip mine, drilling capacity and profit per shift are high. A three-man crew maintains continuous drilling up to 170 feet (depending on number of augers used and horse power of engine). For high veins, double overlapping holes are drilled to get maximum recovery.

Finger-tip controls replace all painstaking manual labor. Augers are moved into drilling readiness in a few seconds. At the Cadix mine initial drilling of holes to a depth of 120', retracting augers and moving itself to next hole averaged an hour and four minutes.

Rugged construction and sufficient weight brace the new McCarthy machine for the toughest drilling conditions. You can depend on McCarthy for peak performance that nets you BIG PROFITS.



#### SPECIFICATIONS OF MODEL 12-36-24 RECOVERY DRILL

**SIZES**—32' long, 8' wide, 17' high. When crane frame and auger rack superstructures are removed, height is 12' for underground clearance.

**GROSS WEIGHT**—Approximately 20 tons without conveyor and auger equipment.

**ENGINE**—Diesel, gasoline or electric motor.

Contact Salem Tool today for information and further specifications. At your request the Salem Tool representative will call at a time convenient to you.



**THE SALEM  
TOOL CO.**

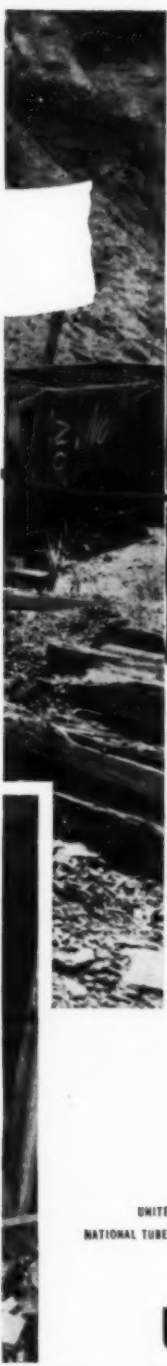
705 S. ELLSWORTH AVE. • SALEM, OHIO, U. S. A.

Salem Tool manufactures 3" to 54" diameter augers for blast holes or coal recovery.

*How's this for service?*



**THIS VIEW OF A CAR INTERIOR** and the other outside views of this equipment show the excellent condition of these U.S.S. Con-Ten steel cars after 11 years of service. No maintenance has been required on any of the steel parts, not even painting. It is significant that of the 29,725 Con-Ten steel mine cars built to date, almost 60% have been built on repeat orders—after the original Con-Ten steel cars had proved in service how much better they would perform and how much cheaper they were to use.



# Mine Cars made of U-S-S COR-TEN Steel\*

**...on the job 11 years  
...required no maintenance**

**E**LEVEN years ago, in 1941, the Irwin Foundry & Mine Car Company built 50 mine cars of  $\frac{1}{4}$ -inch COR-TEN steel for the Greensburg, Connellsville Coal & Coke Company.

For 8 years these cars were operated in deep mine service. Then three years ago they were brought above ground for use in strip mining. Here they have been carrying raw coal from the tippie to the cleaning plant—a distance of four miles and averaging four round trips a day.

Despite this hard usage, despite long exposure to acidulous mine water underground and to the corrosive conditions of continuous outdoor operation, the COR-TEN steel cars are still in service—and still in good shape. None of the steel parts of the cars has required maintenance of any kind, not even painting. Indications are that no major repairs will be needed for several years at least.

Why do mine cars built of U-S-S COR-TEN High Strength steel stand up so well?

The reason is simple. It's because COR-TEN

steel is stronger, tougher and has much greater resistance to deterioration than plain carbon steel. Its yield point of 50,000 psi is  $1\frac{1}{2}$  times higher. It has greater ability to resist shock, abrasion and wear. Its fatigue resistance is 60% higher. It has 4 to 6 times the resistance to atmospheric corrosion of carbon steel. These are properties that pay off in longer life, lower maintenance and lower operating costs. By taking advantage of this remarkable combination of properties, cars built of COR-TEN steel will out-last and out-perform cars built of plain steel.

These facts are important to you . . . mighty important if you're interested in economical mine operation.

Write to our nearest office and get complete information on the important, money-saving advantages that U-S-S COR-TEN High Strength steel offers you.

\*COR-TEN is the registered trade-mark of United States Steel Company for one of its high-strength, low-alloy steels.

UNITED STATES STEEL COMPANY, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO  
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

**U-S-S COR-TEN High Strength STEEL** 

**UNITED STATES STEEL**

# THE VICTAULIC® METHOD OF PIPING



## EASIEST WAY TO MAKE ENDS MEET



Sizes— $\frac{1}{4}$ " through 60"

**VICTAULIC**  
COMPANY OF AMERICA  
P. O. Box 509 • Elizabeth, N. J.  
Office and Plant: 1100 Morris Ave.  
Union, N. J.  
Telephone: Elizabeth 4-2141

Copyright 1952, by Victaulic Co. of America

The VICTAULIC METHOD is a complete line of Victaulic Couplings, Full-Flow Fittings and Vic-Groover Tools for mechanical piping construction. It's the easy way to hook-up pipe . . . it's fast and versatile . . . it's complete and all-inclusive! Use the VICTAULIC METHOD and you streamline piping . . . cut costs!

The Easy-to-use Victaulic Coupling . . . world-famous for quick, leak-proof connections . . . is the basic element of the VICTAULIC METHOD. For use with this coupling, Victaulic offers a complete line of top efficiency Full-Flow Elbows, Tees, Reducers and other Fittings . . . PLUS Vic-Groover Tools for preparing pipe ends easily and quickly right on the job!

Mis-alignments, expansion and contraction are automatically taken care of by Victaulic, locked-joint, leak-tight piping is assured. For new construction, repairs or alterations . . . for any piping job, big or small, the VICTAULIC METHOD is the easiest way to make ends meet.

The name VICTAULIC is more than a trademark . . . it stands for world leadership in a speedy, dependable piping method . . . backed by unexcelled engineering and years of proved experience. FOR YOUR OWN PROTECTION . . . be sure you get VICTAULIC!

Write today for Victaulic Catalog & Engineering Manual No. 44-8A

### 28th VICTAULIC YEAR

California: Victaulic Inc., 727 W. 7th St., Los Angeles 14

Canada: Victaulic Co. of Canada Ltd., 406 Hopewell Ave., Toronto 10

Export: Pipe Couplings, Inc., 30 Rockefeller Plaza, N. Y. 20, N. Y.

## PERSONALS . . . from p 130

made general assistant mine foreman, and Peter Keever, maintenance foreman, at Mine No. 10.

Rufus Morris has been appointed general tippie foreman, Widen mine, Elk River Coal & Lumber Co., Widen, W. Va., succeeding George N. Perkins, resigned. Before joining Elk River, Mr. Morris was associated with Warner Collieries Co. for many years.

Eastern Gas & Fuel Associates, Mt. Hope, W. Va., has announced the promotion of E. W. Elliott, assistant labor relations manager, Coal Div., to labor relations manager, succeeding C. R. Stahl who retired July 1. Mr. Elliott worked 23 yr as mine accountant before his entrance into the labor-relations field in 1951.

Perry B. Gaddis, McClellandtown, Pa., has been appointed a Pennsylvania state bituminous mine inspector, succeeding the late Edward A. Girod. Mr. Gaddis had been employed in the U. S. Steel Co.'s mines in a supervisory capacity since 1935, and was assistant mine foreman, Robena mine, before his appointment.

Ballard Wright, formerly mining engineer, has been named superintendent at the Elkhorn, W. Va., operations of the Crozer Coal & Land Co.

Hewitt Smith, vice president in charge of mining, Woodward Iron Co., Birmingham, Ala., has been named vice president in charge of operations. Mr. Smith joined the company in 1941 and has served as general mining superintendent. Other organizational changes include the promotion of John W. Hager, chief mining engineer, to general superintendent of mining operations, and Thomas H. Kirk, superintendent, Mulga mine, to chief mining engineer. Paul R. Ford becomes superintendent of the Mulga mine, and M. T. Gilchrist, Jr., formerly assistant superintendent at Mulga, becomes superintendent of the Dolomite mine.

James C. Hanlin, industrial safety supervisor, has been named chief of the Mine and Industrial Div., Alabama Department of Industrial Relations. He succeeds A. Finley Harper who resigned Aug. 12 because of ill health. A graduate of Alabama Polytechnic Institute, Mr. Hanlin has been industrial safety supervisor for 13 yr. Mr. Harper, also an API graduate, has been chief of the division since December, 1949.

Thomas Nelson, safety inspector, Rich Hill Coal Co., Hastings, Pa., has retired after more than 65 yr. in the industry. Beginning his mining career at the age of 11, Mr. Nelson has outworked a number of coal mines. He is a staunch advocate of safety and has enjoyed more than six decades of mining with only one slight accident.

Frederick Sanner, mining engineer at Willow Grove No. 10 mine, Hanna Coal Co., Div. Pittsburgh Consolidation Coal Co., Willow Grove, Ohio, has retired after 39 yr. with the company. Mr. Sanner who has been succeeded by Ralph





**VERSATILE PERFORMER.** Seam-cleaning is but one of the jobs this TD-14A with 2-yd. bucket handles so efficiently for DeBardelben Coal Co. Haul-road maintenance, truck loading and cable moving are also all in a day's work.

# Cleaning the Seam at Sipsey



**FAST MOVE.** Heavy cable carrying 5,000 volts to electric power shovel is moved speedily and safely by TD-14A with assist from half-round piece of steel welded to the bucket.

## International TD-14A Speeds Variety of Jobs in DeBardelben Strip Mine

The DeBardelben Coal Company goes through an overburden from 15 to 65 feet deep to get at a 24-inch seam of high grade coal in its strip mine at Sipsey, Alabama.

Needing equipment that is not only versatile but durable and economical, DeBardelben uses an International TD-14A crawler equipped with a 2-yd. bucket loader to clean the seams, maintain roads, move cable and load trucks.

"We've used Internationals for six years," says Superintendent, L. R. Jackson, "and they

are mighty handy tools! We sure need the extra power of this TD-14A to handle the thick layer of shale, stone and slate the power shovels leave on the seam and to do all the many jobs that crop up here in a day's work."

For down-to-earth details on the entire International line, see your International Industrial Distributor today. You'll be an International owner yourself from then on in!

INTERNATIONAL HARVESTER COMPANY  
CHICAGO 1, ILLINOIS

**SEE YOU  
AT THE POLLS!**



**INTERNATIONAL**

**POWER THAT PAYS**

# Smooth Flow



Whether your belt conveyor carries coal above or below ground, the ideal preventive of motor-wrecking power surges and shock loads is Twin Disc's famous shock absorbing double circuit HYDRAULIC COUPLING.

Leading conveyor manufacturers today equip their coal-

For above-ground or under-ground belt installations, Goodman Manufacturing Company uses Twin Disc's 13.2" Hydraulic Coupling between A. C. Motor and speed reducer on its type 97HC30 Belt Conveyors. Couplings are available for electric motors and engines developing from 1/4 to 700 hp.

flow devices with this power smoother. They have proved that the Hydraulic Coupling piles up savings by reducing peak current loads, preventing motor burnouts, protecting drives from shocks.

For information, ask for Bulletin 144-B, or call your nearest Twin Disc Hydraulic Coupling dealer.



TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois  
BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • WOLFE

Snyder, formerly of Hundred, W. Va., was honored at a dinner given by company and mine officials.

Leslie M. Case, deputy director of NPA's Machinery Div., has been named director succeeding Harold A. Montag, who has returned to the executive staff of Joy Mfg. Co. During World War II, Mr. Case served as chief of the mining machinery section of WPB's Mining Div. Mr. Montag will continue to serve as a consultant to the government on mining machinery and supply matters.

Charles H. Geho, assistant chief chemist, Philadelphia & Reading Coal & Iron Co., Philadelphia, Pa., has been promoted to chief chemist, succeeding the late E. A. Reilly. Robert Schick succeeds Mr. Geho as assistant chief chemist.

## Obituaries

T. A. Isaac, 76, vice president, Black Diamond Coal Mining Co., Drakesboro, Ky., died Aug. 4, at his home of a heart ailment.

Thomas J. Gillen, superintendent, Gillen Coal Co., Carbondale, Pa., died Aug. 6. He organized the Gillen Coal Co., in 1939, and prior to that time, was employed by Pearl Coal Co., Richmond, for 14 yr.

Earl J. Weimer, 60, associated with Koppers Coal Co., Grant Town, W. Va., before his lingering illness in 1944, died July 31 at Veterans Hospital, Wadsworth, Kan. Mr. Weimer began his mining career in Illinois at the age of 17, later moving to Kansas where he worked in the mines near Pittsburg and studied at the Missouri School of Mines and Metallurgy, Rolla, Mo., graduating in 1917. He had been in coal mining in the Illinois-Indiana fields in many engineering and supervisory capacities, as well as in the Western Pennsylvania and Northern West Virginia fields. He was superintendent of the Wildwood mine, Butler Consolidated Coal Co., when it opened in 1928 as the country's first fully mechanized mine.

Thomas H. Claggett, 76, vice president, Pocahontas Land Co., Bluefield, W. Va., died July 25 in the Bluefield Sanitarium. He had been active in the coal industry since 1905 and at the time of his death he was on the Mining Development Committee of BCR. Among other activities, Mr. Claggett was past president of the Bluefield Rotary Club, former vice president of the Bluefield Chamber of Commerce and active in the Red Cross.

W. Kenneth Moffat, 60, partner of the Moffat Coal Co., Taylor, Pa., and president, Natalie Coal Co., Mt. Carmel, Pa., died July 11, at his home. He was associated with his brother in the coal industry in Scranton and Fleetville.

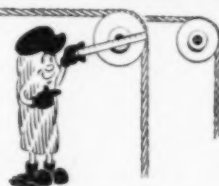
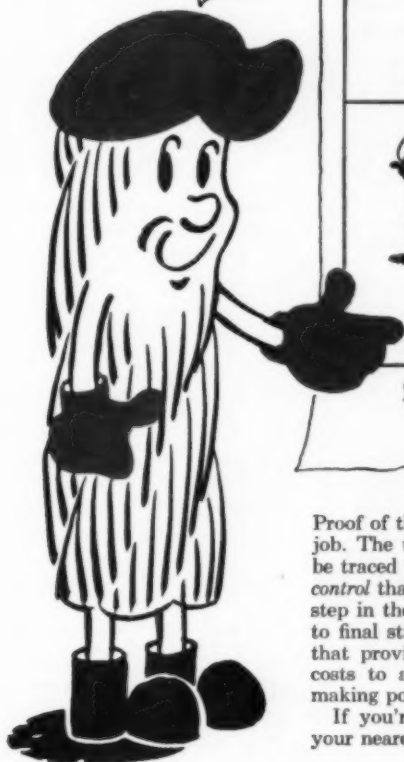
MANY A COAL MAN has found a helpful trick in COAL AGE'S "Operating Ideas." Let us print yours. See p 117.

# Shovel and Dragline Operators

do you  
want to cut  
operating costs?

**J&L  
STEEL**

*Here are a  
few tips on longer  
Wire Rope Service  
Life!*



Avoid Small Drums  
and Sheaves



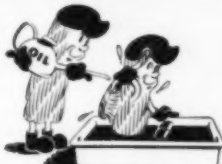
Keep Lines from Rubbing



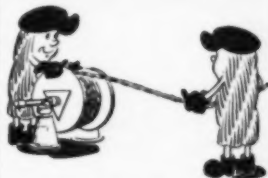
Keep Drums and  
Sheaves Aligned



Check Your Sheave  
and Drum Grooves



Lubricate Your  
Lines Regularly



Use Jacks When Transferring  
Lines from Reel to Drum

**SPECIFY J&L WIRE ROPES  
FOR YOUR EQUIPMENT**

Proof of the value of any wire rope lies in its performance on the job. The unexcelled performance record of J&L Wire Ropes can be traced to J&L's *quality control* method of manufacture. *Quality control* that ensures the finest finished product by regulating every step in the manufacture of wire rope from the mining of iron ore to final stranding and closing operations. The result is wire rope that provides maximum service life—helps keep your operating costs to a minimum by cutting down time for re-rigging and making possible maximum production per wire rope dollar.

If you're not already using J&L wire rope, why not contact your nearest J&L representative today.

**JONES & LAUGHLIN STEEL CORPORATION**  
PITTSBURGH 30, PA.



**WITH STEARNS MAGNETIC PULLEYS**



**TRAMP IRON  
YOUR  
HEADACHE?  
TAKE YOUR COST-CUTTING  
CUE FROM STEARNS  
MAGNETIC EQUIPMENT...**

*Avoid costly damage to crushers, grinders, screens and other expensive equipment by using a STEARNS Electro or Permanent Magnetic Pulley.*

**HANDLING** run of mine coal at the rate of 350 tons per hour, this STEARNS Magnetic Pulley protects expensive crushers and screens by continuous and automatic tramp iron removal. If you want to reduce shut-down time and keep repair charges to a minimum — install a STEARNS Magnetic Pulley, the only economical and effective insurance against the tramp iron nuisance.

**WHETHER** your problem is the fairly simple job of tramp iron removal or the concentration and beneficiation of complex ores, STEARNS has EXPERIENCE ENGINEERED equipment to meet your specifications.

For a thorough investigation of your separation problem, STEARNS offers complete laboratory research facilities. Write today for details on testing of sample material.

#### **STEARNS MAGNETIC EQUIPMENT FOR EVERY MINE LARGEST!**

● Whether your needs are large or small, STEARNS has an electro or permanent magnetic pulley for you. Here's the World's Largest Electro-Magnetic Pulley — 60 inches in diameter, 36 inches wide.

#### **SMALLEST!**

● This is our smallest standard pulley; 12 inches high, 12 inches wide. Write for descriptive literature.



*Foremost in the Magnetic Field*  
**Stearns** MAGNETIC INC.

661 South 28th Street, Milwaukee 46, Wisconsin

## **Association Activities**

### **Smoke Group Changes Name**

After "suffering from hyperonomatomekia for more than 2 yr," the Air Pollution and Smoke Prevention Association of America, Inc., Pittsburgh, has changed its name to the Air Pollution Control Association following a vote of its members. Robert T. Griebing, executive secretary, has announced. The original name of Smoke Prevention Association taken by the group in 1907 was changed in 1950 to indicate the greater diversification of activity. But that name was far too long for comfort, Mr. Griebing reported, in explaining that "Hyperonomatomekia is plain Greek for plain English 'unusually long name.'"

### **NEW MINES . . . from p 138**

cock mine and coke ovens, with the coal processed over the Royalty cleaning plant now under construction at Landisburg, W. Va. The company plans to develop the Royalty and Babcock mines to a capacity 500,000 tons annually by the end of the first year, adding 100,000 tons of capacity each year until the full development is reached at 1,000,000 tons annually. The 15,000 acres required from Babcock added to Royalty's reserves of some 20,000 acres makes the company's holdings the largest virgin acreage of Fire Creek and Sewell seam coal in the entire New River field, it is reported. E. Morgan Massey is vice president in charge of operations for the company. Paul Morton is general manager and Robert Turner is mine superintendent.

### **Barnes & Tucker Acquires Coal-Land Leasing Firm**

Barnes & Tucker Co., Barnesboro, Pa., has acquired the Bluhaker Coal Co., Spangler, Pa., a 64-yr-old company engaged in leasing coal lands. Rights to some 9,000 acres of coal lands were included in the purchase. Richard T. Todhunter Sr., Barnes & Tucker president, will serve as president of the Bluhaker Coal Co., which will be operated as a subsidiary, with offices in Barnesboro.

### **Phoenix Park Re-Opening Approved by Court**

A plan for the sale and re-opening of the former Phoenix Park colliery of the Phoenix Coal Co., near Pottsville, Pa., reportedly has been approved by Judge James J. Curran of the Schuylkill County Court. Under the plan, Lawrence Bisconti, of Nanticoke, is to set up two corporations which will pay royalties on coal mined to creditors as payments on the debts of some \$430,000 that caused closing of the colliery in August, 1950. At the time of its closing, the colliery employed about 450 men.

### **And For Your Information . . .**

The Mingo Mason Fuel Co., headed by Dennis and Ed Smith, of Middlesboro, Ky., began stripping operations this summer on some 13 mi of mountain outcropping near Mingo Hollow, Tenn. The

# STOP RUST!

with  
**RUST-OLEUM**



Available in ALL COLORS,  
Aluminum and White. Proved  
Throughout Industry For Over 25 Years

Deep underground pipes, coal cars, machinery — tipples — all *rustable* after wirebrushing and scraping. Specify **RUST-OLEUM** to your painting contractor or maintenance department for new construction, maintenance or remodeling. Prompt delivery from Industrial Distributor stocks in principal cities. Write for complete literature — today!

**RUST-OLEUM CORPORATION**  
2463 Oakton Street — Evanston, Illinois

**FREE SURVEY:** Place your rust problems in the hands of a **RUST-OLEUM** specialist. He will conduct a survey, including applications, specific tests and recommendations. No cost or obligation. See Sweets for catalog and nearest **RUST-OLEUM** distributor, or write for literature on your company letterhead!

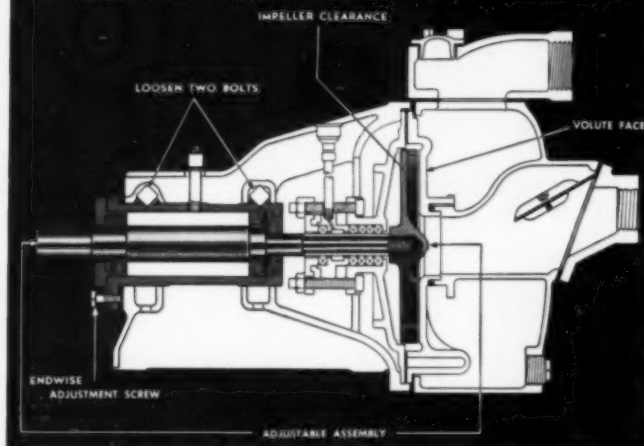


**It's Easy To Get The Facts —  
Clip This To Your Letterhead**

- ☐ We Have A Rust Problem — Have A Qualified Representative Call
- ☐ Free Survey
- ☐ Complete Literature
- ☐ Nearest **RUST-OLEUM** Source



# HERE IS THIS MINE PUMP'S FOUNTAIN OF YOUTH



## RENEWES THE PUMP TO BRAND NEW PERFORMANCE IN ONLY A FEW MOMENTS!

Gorman-Rupp pumps are noted for their high pumping efficiency and their long trouble-free service.

In any pump, however, under the gruelling requirements of mine service and acidity of mine water, certain parts are subject to wear.

The point most affected by these conditions is the clearance between the impeller face and the volute face. Due to wear this clearance increases, resulting in loss of head and capacity.

### THE ANSWER IS SIMPLE WITH A GORMAN-RUPP

Loosen two bolts and move the entire Adjustable Assembly forward (see illustration) by means of the endwise adjustment screw. This reduces the impeller clearance to normal and — **THE PUMP PERFORMS LIKE NEW.**

Gorman-Rupp pumps save money in mine operations and require very little headroom.

Ask for Bulletin O-ME-11

#### DISTRIBUTED BY

Auto Machine Company, Marion, Illinois  
Athens Armature and Machine Co., Athens, Ohio  
The Bittenbender Co., Scranton, Pa.  
Buckeye Machine Supply Co., New Philadelphia, Ohio  
Bluefield Supply Co., Bluefield, W. Va.  
Cambridge Mach. & Supply Co., Cambridge, Ohio  
Central Mine Supply Co., Mt. Vernon, Illinois  
Central Mine Supply Co., Madisonville, Ky.  
Greenville Supply Co., Greenville, Ky.  
General Machinery Co., Birmingham, Alabama  
Guyan Machinery Co., Logan, W. Va.

Hot Supply Co., Christopher, Illinois  
Industrial Supply Co., Terre Haute, Indiana  
Jackson Implement Co., Jackson, Ohio  
Johns Equipment Co., Ft. Wayne, Indiana  
McComb Supply Co., Harlan, Ky.  
Mine Service Co., Lathair, Ky.  
Reliable Electric & Equip. Co., Zanesville, Ohio  
Superior Sterling Co., Bluefield, W. Va.  
Tennessee Mill & Mine Supply Co., Knoxville, Tenn.  
West Virginia Pump & Supply Co., Huntington, W. Va.  
Weinman Pump & Supply Co., Pittsburgh, Pa.

THE



GORMAN-RUPP COMPANY

306 BOWMAN STREET, MANSFIELD, OHIO

company is reportedly working on a government order that will take care of the mine output for about 8 mo.

Higher operating costs and market conditions were cited as major factors in the closing of several coal mines reported recently. In Colorado, the Colorado Fuel & Iron Corp. announced that it would close and dismantle its Crested Butte mine in the latter part of July. Believed to be the Nation's highest coal mine, at an elevation of 10,162 ft. the mine has been in operation since 1860 and recently had been employing about 100 men. While "there still is a big seam of very fine coal . . . it just doesn't pay to bring it up out of the ground," a company official reported.

In Illinois, the St. Ellen mine of the Perry Coal Co., O'Fallon, reportedly was being closed indefinitely during early August as a result of high costs and restricted market demand. Re-opening of the mine, which has been employing 300 men and producing 3,800 tpd, will await the time when it can be operated profitably, company officials reported. Permanent closing of the Coalton mine of the Nokomis Coal Co. also was reported early last month. The shutdown was forced by lack of market brought about by competition of gas and oil, it was said. In the Gillespie area, Mine No. 2 of the Superior Coal Co. was being "closed for repairs" that were expected to take at least the month of August. On re-opening of the property, the company expects to close down its No. 3 mine at Mt. Clare, it was reported.

In the Pennsylvania anthracite region, the Kehoe-Berge Coal Co. closed its No. 10 Tunnel, Duryea, following condemnation of a vein by state inspectors as unsafe. The company announced that a new slope would be developed near the abandoned tunnel, which was the first operation acquired by it. Shortly before, on July 7, the company's William A. colliery, employing 150 men, had been shut down.

### Preparation Facilities

United Electric Coal Cos., Buckheart mine, Canton, Ill.—Contract closed with Nelson L. Davis Co. for alteration of existing truck dump hopper and installation of a new R-O-M conveyor, 12 x 17-ft Bradford breaker with 6-in round-hole screen plate and pre-sizing screens for preparing 6 x 3, 3 x 1½, 1½ x ¾ and ¾ x 0 by wet screening; ¾ x 0 fraction to be delivered to a new enlarged free-discharge launder which will be supplemented by a new installation of six Deister tables further supplemented by additional centrifugal-drier capacity; each of the three larger sizes to be individually treated by Neldo heavy-media processor assemblies with float coal recovered separately loaded by three existing loading booms; sink fraction of 6 x 3 and 3 x 1½ to be crushed to minus ¾ and screened for removal of minus ¾ which will then be combined with the natural minus ¾ feed to the fine-coal plant, while the 1½ x ¾ crushed primary rejects will be retreated in a



DUE TO ITS *Interchangeability*, YOU CAN USE  
**WILMOT RIVETLESS CHAIN**  
**FOR *Any* REPLACEMENT**

As the originators of rivetless chain, Wilmot not only offers the largest choice of sizes available, but furthermore Wilmot chain of any given size number will interchange with the same number of any other chain. This larger choice and complete interchangeability are shortening "down" time for hundreds of our customers. And it explains why an increasing number of leading firms are cutting their inventories of spare conveyor parts by depend-

ing on Wilmot for all replacements. Wilmot has, or will design, everything for your conveyor from sprocket to traction wheel.

**WILMOT REPRESENTATIVES**

BIRMINGHAM 4, ALA. -- Amos A. Culp, 930 Second Avenue, North

CHARLESTON 23, W. VA. -- Cross Pump & Equipment Co., P. O. Box 889

HAZLETON, PA. -- Wilmot Engineering Co., Markle Bank Building

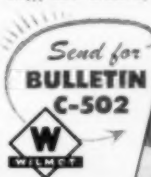
HONOLULU 6, H. I. -- P. S. Pell & Co., Ltd., 88 S. Queen St.

KNOXVILLE, TENN. -- Crowell Engineering & Sales Co., 3045 Sutherland Ave.

PITTSBURGH 16, PA. -- Harold C. Lusk, 3045 West Liberty Avenue

ST. LOUIS 5, MO. -- Jack Van Horn, 7543 Cromwell Drive

NEW YORK 38, N. Y. -- International Manufacturing & Equipment Co. (export only), 220 Broadway



**WILMOT ENGINEERING CO.**

HAZLETON, PA.  
 Plant:  
 WHITE HAVEN, PA.

# THE IMPROVED Exide-Ironclad BATTERY

## OUTSTANDING NEW FEATURES INCLUDING

the polyethylene insulating tube sealer combine to make Exide-Ironclad, *more than ever before*, YOUR BEST POWER BUY... AT ANY PRICE.

## THE IMPROVED EXIDE-IRONCLAD IS BUILT TO GIVE YOU...

RAPID, HIGH PRODUCTION HAULAGE, more trips per shift... HIGH MAINTAINED VOLTAGE, with uniform speed to end of shift... HIGH AVAILABILITY... LOW OPERATING COSTS... LOW MAINTENANCE COSTS... LOW DEPRECIATION COSTS... SAFETY from hazards of fire and fumes.

## BECAUSE OF...

### IMPROVED POSITIVE PLATE CONSTRUCTION.

The long-life grids now contain SILVIUM—an alloy of silver, lead and other components—which make them highly corrosion resistant.

...the New Polyethylene insulating tube sealer of acid-proof, non-corroding plastic. It fits snugly into slotted tubes of positive plate, and reduces loss of active material. Even the small sediment deposit of the past is reduced 50%. Thus more active material remains available, and the high battery capacity is maintained for a longer working life.

IMPROVED NEGATIVE PLATES for higher electrical efficiency.  
NEW SEALING COMPOUND—provides permanent seal between jar and cover.

SEAMLESS SHOCK-PROOF JAR, of high quality rubber combines tensile strength and elongation for long-life and heavy-duty service.

NEW UNBREAKABLE PLASTIC VENT PLUGS of polyethylene.

TYPES, SIZES AND CAPACITIES for mine haulage units of every make.

THE ELECTRIC STORAGE BATTERY CO.  
Philadelphia 2

Exide Batteries of Canada, Limited, Toronto

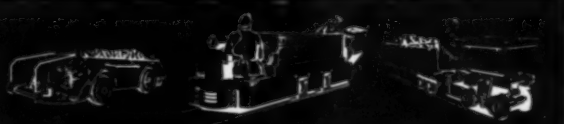
1888...DEPENDABLE BATTERIES FOR 64 YEARS...1952

"EXIDE-IRONCLAD" and "SILVIUM" Reg. T.M. U.S. Pat. Off.



VISIT EXIDE BOOTH 414  
1952 Mining Show  
Denver, Sept. 22-25

Exide-Ironclad  
IS YOUR BEST POWER BUY  
... AT ANY PRICE



fourth Neldco heavy-media assembly; the  $1\frac{1}{4} \times \frac{1}{4}$  float coal recovered by retreatment to be combined with the natural  $1\frac{1}{4} \times \frac{1}{4}$  float coal or loaded separately as desired, and the  $1\frac{1}{4} \times \frac{1}{4}$  clean coal then to be subsequently divided into  $1\frac{1}{4} \times \frac{3}{4}$  and  $\frac{3}{4} \times \frac{1}{4}$  preliminary to loading into cars over existing loading booms; washery rejects to be conveyed to bin for final disposal by trucks, with Bradford-breaker rejects discharged to separate bin for truck disposal; new settling cone also to be installed to improve clarification of plant process water and reduce sludge losses to existing settling pond; new building structure to supplement existing structures, which will be altered to suit; raw-coal feed capacity to plant to be 1,000 tph, with nominal 850 tph treated by primary heavy-media and 150 tph in fine-coal plant; approximately 200 tph additional of primary heavy-media rejects to be retreated by heavy-media.

**Kaiser Steel Corp., Sunnyside mine, Sunnyside, Utah**—Contract closed with McNally Pittsburgh Mfg. Corp. for expansion of present washing facilities, including two McNally Norton automatic washers for cleaning 650 tph of  $6 \times 0$  raw coal; washed coal classified on re-worked screening and loading facilities at  $1\frac{1}{2}$  in.,  $\frac{1}{2}$  in., and  $3/16 \times 0$ , with latter centrifugally dried in recirculated water circuit kept closed by use of thickener and filters; present washing facilities to be maintained for future middling rewash.

**Republic Steel Corp., Sayre mine, Sayre, Ala.**—Shipment by Deister Concentrator Co. of 16 SuperDuty Diagonal-Deck No. 7 coal-washing tables for cleaning  $\frac{1}{4} \times 0$  and two Model 108-B distributors arranged for 8-way feed distribution to the 16 tables.

**Bell & Zoller Coal & Mining Co., Buckhorn mine, Herrin, Ill.**—Shipment by Deister Concentrator Co. of three SuperDuty Diagonal-Deck No. 7 coal-washing tables for cleaning sludge.

**Campbell Brown Co., Huntington, W. Va.**—Shipment by Deister Concentrator Co. of one SuperDuty Diagonal-Deck No. 7 coal-washing table for cleaning  $1\frac{1}{4} \times \frac{1}{4}$  river coal.

**Dawson Collieries Co., Dawson Springs, Ky.**—Shipment by Deister Concentrator Co. of two Leahy heavy-duty NO-Blind vibrating screens equipped with Deister FlexElex arrangement for electrically heating screen cloth.

**Lehigh Valley Coal Co., Dorrance colliery, Wilkes-Barre, Pa.**—Contract closed with Wilmot Engineering Co. for one Wilmot-Daniels heavy-density unit, dual system with one 400A and one 200C Roller (HM) coal cleaners, for preparing egg to No. 1 buckwheat sizes of anthracite at a feed rate of 500 tph; one 6-ft-diameter Wilmot Hydrotator for rice, feed capacity, 55 tph; two 5-ft-diameter Wilmot Hydrotators for barley and Buckwheat No. 4, total feed capacity, 90 tph; and one 12-ft-diameter Wilmot froth-classifier unit for preparing minus  $3/64$  to plus 100-mesh anthracite, feed capacity, 50 tph.



## ...it's a TRANSITE PIPE mine drainage line!



Carrying acid mine waters day in and day out is no problem for corrosion-resistant Transite Mine Service Pipe.

In many installations—some of them under corrosive conditions so severe that ordinary pipe failed in months—this asbestos-cement pipe has been in service for as long as 15 years—and with no replacements!

In addition to its long-term economies this pipe has many practical advantages that make it ideal for mine service. Tough and strong, it won't deform in use. Yet it is light in weight and easily installed. It is quickly coupled together, even in restricted mine passages—can be laid around curves or obstructions without special fittings. Its tight joints stay tight in service.

Available for working pressures up to 150 lbs. per sq. in. and in a full range of sizes, Transite is the money-saving pipe for many mine service requirements, including drainage lines, water supply lines, etc. For further information, write for Brochure TR-51A. Address Johns-Manville, Box 60, New York 16, N.Y.

Transite is a Johns-Manville registered trade mark



The factory-made joints of Transite Mine Service Pipe are assembled with a simple coupling pulley.



Curves present no problem with Transite Mine Service Pipe. Deflections up to 5" can be made at each joint.



Tough, strong asbestos fibers help give Transite Mine Service Pipe many of its outstanding qualities.





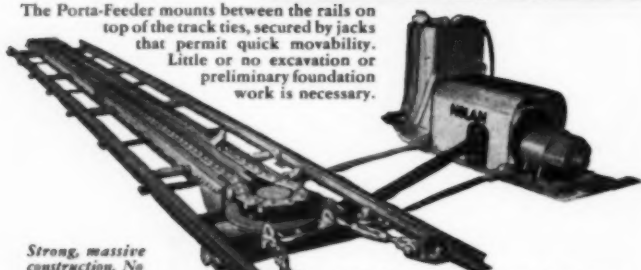
# NOLAN PORTA-FEEDER

**an important profit factor in  
big Pennsylvania mine!**

The photo at the right shows a 15 H.P. Nolan Porta-Feeder used for moving cars quickly and efficiently, saving time and money day after day, in a big Pennsylvania mine operated by a major steel company. Installations such as this have shown Nolan Porta-Feeder records of savings as high as 40 minutes per shift in spotting cars for loading, for a large number of coal operators.



The Porta-Feeder mounts between the rails on top of the track ties, secured by jacks that permit quick movability. Little or no excavation or preliminary foundation work is necessary.



*Strong, massive construction. No ropes or cables, no inflammable hydraulic oil. Short-shaft delivery of power. Quick movability of entire unit.*

The drive is on skids and is connected to the gear head by a strong universal joint and propeller shaft assembly. A sealed drive head allows operation in water up to the base of the rails. Reciprocating pushing dogs deliver constant forward feeding motion.

*Write for full details immediately.*



MODEL	H. P.	DRUM BAR PULL	SPEED	WEIGHT
NLSN	9	6000	25 F.P.M.	3700
NL7N	7½	9000	25 F.P.M.	3850
NL10N	10	9000	35 F.P.M.	6300
NL15N	15	13000	35 F.P.M.	6750

**THE NOLAN COMPANY**

106 PENNSYLVANIA ST.  
BOWERSTON, OHIO

## COAL MEN ON THE JOB ... Big Sandy-Elkhorn Seniors' Day

**LEFT PHOTO:** Will Rainey (left), section foreman, Inland Steel Co.; Harry McCarty, safety director, Clear Branch Mining Co.; J. E. Green, vice president, Utilities Elkhorn Coal Co.; and Seth Kegan, public relations director, Consolidation Coal Co. (Ky.).

**RIGHT PHOTO:** J. H. Mosgrove (left), secretary, Big Sandy-Elkhorn Coal Mining Institute; Charles Jackson, Mine Safety Appliances Co.; and A. N. Ayers, general manager, Russell Fork Coal Co.

## OVERHEAD STORAGE



## THE MOORE LOCKERBASKET

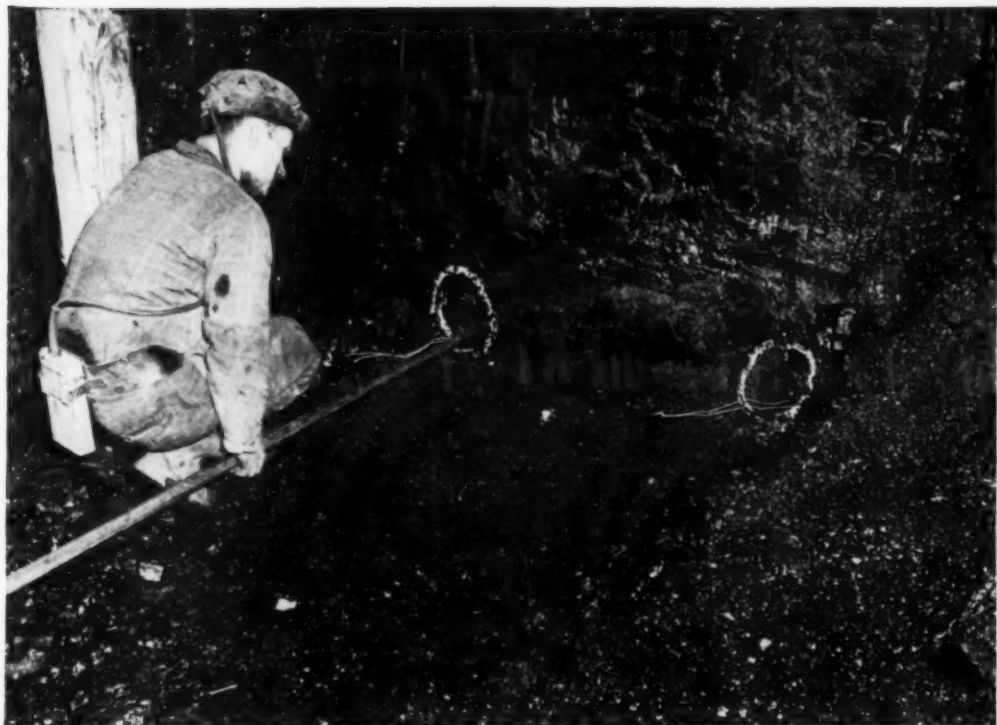
A new type basket for secure and sanitary overhead storage of clothing and effects in modern change-rooms. Basket (18" square) slides on hanger, lowers onto garment hooks, gives slip-proof suspension. Galvanized electro-welded wire, 1200 cu. in. storage.

Write for Catalog and free book, "The Design and Layout of Industrial Change Rooms."

## THE MOORE COMPANY

DEPT. 3, 1036 QUARRIER STREET  
CHARLESTON, W. VA.





## Iron wire caps get out the coal

You can rely on Du Pont Iron Wire Electric Blasting Caps to do an efficient, dependable and economical job for you. Developed especially for coal-mine blasting, these top-quality caps offer attractive savings over copper-wire caps and almost always serve the purpose equally well.

Iron Wire Caps have all the desirable features of other Du Pont Electric Blasting Caps, including plastic insulated wires, waterproof rubber plug closures and aluminum-foil insulated shunts. Moreover, the insulation is white . . . providing the greatest possible contrast to the coal. And the wires can be readily removed by magnetic separators.

Tremendous quantities of copper are needed for

the national defense program. You can assist in this effort and save money at the same time by using iron wire caps. While these caps have higher resistance than copper, you'll find that permissible multiple-shot blasting machines have ample capacity for your requirements.

It's worth looking into the possibility of using Du Pont Iron Wire Electric Blasting Caps. Consult with your Du Pont Explosives representative . . . he'll be glad to help you determine the most efficient product for your particular needs.

E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

### DU PONT EXPLOSIVES

*Blasting Supplies and Accessories*



*150th Anniversary*

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

# What do you do when you don't have the right size v-belt in stock?

1

Contact your supplier for a replacement

...and wait for delivery  
...wait—and watch production stay at zero



3

Stock **VEELOS**...



2



Send someone to get the required belt

...and pay your employee while he goes for the belt  
...pay through loss of production

## GET ALL THE FACTS



This Veeelos Data Book gives complete details about construction, installation and uses. Write for free copy of this money-saving book today.

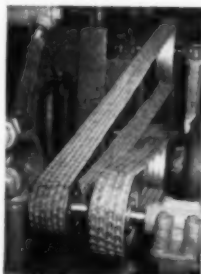
MANHEIM MANUFACTURING & BELTING COMPANY  
614 Manbel St., Manheim, Pa.

## VEELOS in stock is Production Insurance

Belts for replacement always on hand—just 4 reels of Veeelos in the O, A, B and C widths can replace up to 316 different sizes of endless v-belts.

Link construction permits quick installation—without removing outboard bearings.

Adjustability provides controlled tension on each belt—vibrationless, full power delivery is assured.



## ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof, static conducting. Also double V in O, A and B. Packaged on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

**"Tycol Acylkup 'stays put'...  
keeps mine equipment rolling...  
smooths the way for heavier loads"**



Absolutely right! Tycol Acylkup stays put . . . keeps mine equipment running in top condition — inside the mine and out.

Tycol Acylkup reduces low-temperature drag . . . retards lubricant leakage at high temperatures . . . permits the handling of more cars per haul.

Tycol Acylkup is firmly resistant to the washing action of water. Its dependable lubricating ability reduces maintenance costs.

Your nearest Tide Water Associated office will give you further information. Call or write today.



Boston • Charlotte, N. C. • Pittsburgh  
Philadelphia • Chicago • Detroit  
Tulsa • Cleveland • San Francisco



SEND FOR A FREE COPY OF "TIDE WATER ASSOCIATED LUBRICANIA"

USE

# FLEXIPIPE

... the quality ventilating tubing

**DIRECTS FRESH AIR  
WHERE YOU NEED IT**

The new improved Flexipipe is efficient, serviceable and economical. It's made in a variety of diameters and lengths and with various accessories to take care of your requirements. Write us for complete information and sample.

**BEMIS BRO. BAG CO.**  
412 Poplar Street • St. Louis 2, Mo.



**Kleenrot**  
PREPARATION SCREENS for  
SIZING • DEWATERING • SCREENING  
OR FILTERING APPLICATIONS

It is not necessary to change your present machine to accommodate our Vibrator Screens. The wedge shape of the screen wire with its non-clogging, non-blinding features permits perfect separation on wet or dry screening. The rigid construction adds considerably to the screens capability and efficiency. Proven in hundreds of installations.

SEND FOR OUR ILLUSTRATED LITERATURE

**Wedge-Wire**  
CORPORATION  
5602 CLARK AVE. CLEVELAND 2, OHIO

## NEWS BRIEFS ... from p 136

### P.&R. Resumes Research At Mellon Institute

The Philadelphia & Reading Coal & Iron Co., Philadelphia, has resumed comprehensive scientific research at Mellon Institute, Pittsburgh, with the granting of a new Fellowship that will investigate present and future problems pertaining to the production, preparation, transportation marketing and utilization of anthracite, both as a fuel and a source of chemicals. From 1932 to 1937 P.&R. supported a multiple fellowship in the Institute for studies of similar problems and this broad program, which proved quite productive, was extended to the anthracite industry in general from 1937 to 1947. Holder of the new fellowship, which began June 16, is James H. Black, a former instructor in chemical engineering at the University of Pittsburgh and a research worker at Mellon Institute.

### Fatality Rate Down for First 6 Mo of 1952

Men killed in anthracite and bituminous mines from January through June, 1952, totaled 299, or 1.14 per million tons, compared with 355 fatalities and a rate of 1.24 per million tons in the same period of 1951, according to USBM figures. In bituminous, there were 241



### Anthracite Beautifies UN Fountain

PROBABLY FOR THE FIRST TIME in its history, anthracite is being displayed for its beauty rather than its burning qualities. The 24 tons forming a part of the design on the bottom of the new fountain pool (above) in front of the Secretariat Building at the United Nations headquarters in New York replaced the famous black stones ordered from the Island of Rhodes. One of the architects who knew the properties of anthracite suggested it when the stones which had been specified to be used with alternate bands of Vermont marble failed to arrive in time for the pool's opening. Two truckloads of Lehigh Navigation's "Old Company's Lehigh" chestnut in the pool created the desired jet-black contrast alongside the white marble.

deaths in 1952, for a rate of 1.00, as compared with 299 fatalities and a rate of 1.13 for the first 6 mo of 1951. In anthracite, the record showed 58 men killed in 1952, at the rate of 2.96 per million tons, as against 56 deaths in the first half of 1951 and a rate of 2.82. In an analysis of the 299 fatalities in the first half of 1952 by occupation, the Bureau pointed out that 30% of the deaths were among miners, helpers and hand loaders. The 24 supervisors killed, comprising 8% of the total, made up the fourth largest group reported. Totals for anthracite and bituminous were:

### COAL-MINE FATALITIES, JANUARY-JUNE, 1952

Occupation	Under-ground	Surface	Struck	Total
Supervisors	21	2	2	24
Firebosses	1	..	..	1
Miners, helpers and hand loaders	90	..	..	90
Oper. & helpers	..	..	..	..
Cutting mach.	22	..	..	22
Loading mach.	28	..	..	28
Drillers	7	..	3	10
Shotfirers	11	..	..	11
Motormen & brakemen	27	2	..	29
Drivers & runners	1	..	..	1
Shuttle-car operators	16	..	..	16
Misc. haulage	7	4	..	11
Bratticemen	1	..	..	1
Timbermen	9	..	..	9
Tracklayers	4	..	..	4
Machinists	2	1	1	4
Electricians	2	2	..	4
Pumpmen	..	1	..	1
Shovel operators and others	..	..	6	6
Tippie and breaker employees	..	3	..	3
Others	19	5	..	24
<b>TOTAL</b>	<b>267</b>	<b>20</b>	<b>12</b>	<b>299</b>



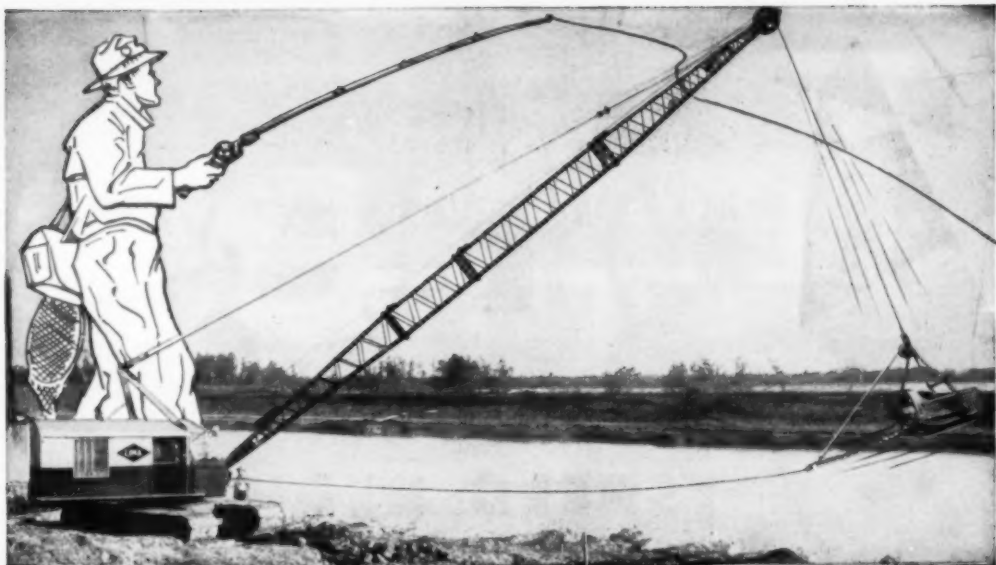
### "W" DENTED SHAKER SCREENS

A "must" when it comes to obtaining an efficient job! Good because the spreading and collecting rifles give uniform spread of material over the entire screen surface... turns the top and middle flow of material down in direct contact with the screen... gives an increased screening efficiency up to 33% on fine sizes over an undented flat screen.

Comes in Carbon and Stainless Steels and Manganese Bronze. No sag.

Write us today. We shall reply promptly.

**REMAY**  
MANUFACTURING CO., INC.  
TAMAQUA, PA.



## LIMA DRAGLINES use *The Fisherman's Secret* FOR A GOOD CATCH

When you're fishing, and want to drop the bait in the far pool where the big ones are waiting, your reel's got to be friction-free to let that line flow out, smooth as cream from a jug. And, after the strike, come in the same way.

When you're after record yardage, a smooth flowing line is just as vital . . . so we took a tip from the fisherman, and made our reels friction-free. You can 'cast' the dragline bucket further, increase your radius of efficient operation from each location. You can bring in bigger catches, because more power is going into the work lines and less into friction drag on the machinery. And there's further big benefits from reduced maintenance . . . less frequent lubrica-

tion, and smoother operation, because misalignment from bearing wear, that affects clutch alignment and functioning, is eliminated.

Lima pioneered the use of anti-friction bearings at all important bearing points on draglines, shovels, and cranes. They've kept on pioneering with other improvements that put Lima equipment in the top rank of profitable performers. If you want proof of this—just ask the Lima user. If you want details on how to put Lima equipment on your pay-off roll . . . just get in touch with us.

BALDWIN-LIMA-HAMILTON CORP.  
CONSTRUCTION EQUIPMENT DIVISION  
LIMA, OHIO, U.S.A.



OFFICES IN PRINCIPAL CITIES OF THE WORLD

# BALDWIN-LIMA-HAMILTON

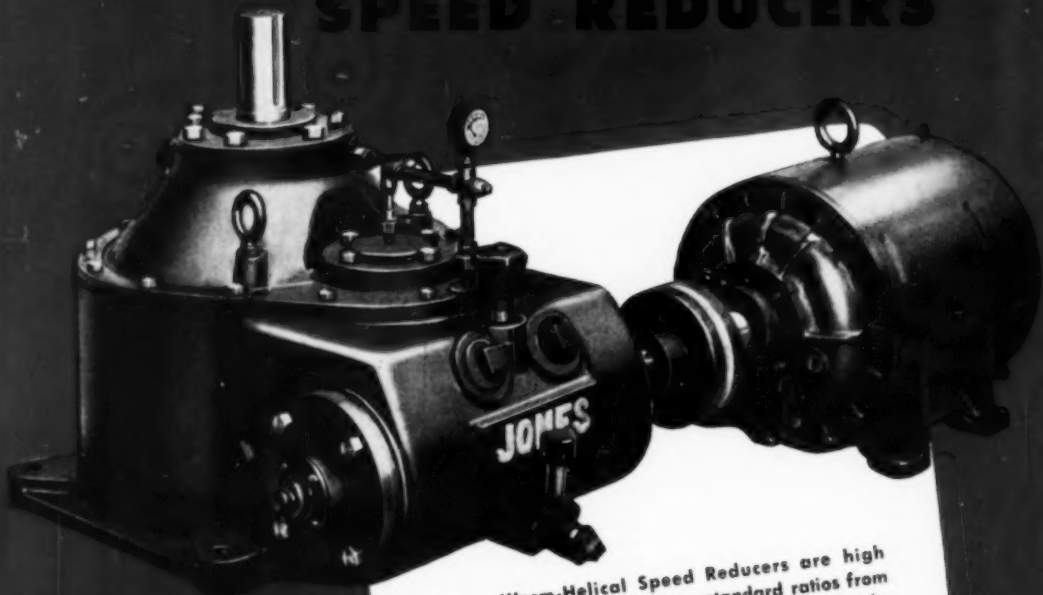
SHOVELS • CRANES • DRAGLINES • PULLSHOVELS • TRUCK CRANES





# Jones

## WORM-HELICAL SPEED REDUCERS



Jones Worm-Helical Speed Reducers are high efficiency units built in fifteen standard ratios from 40 to 1 to 250 to 1 for all common motor speeds. They are ideal for vertical shaft drives to agitators, mixers, bending rolls, etc.

The low speed shaft can be extended up or down, for coupling connection or gear drive.

Bulletin No. 75 covers complete details.

W. A. JONES FOUNDRY & MACHINE CO.  
4401 W. Roosevelt Rd., Chicago 24, Ill.

Since 1890  
**Jones**

*In The Service Of Industry*

REDUCERS - WORM - GEAR - SPUR - BEVEL SPEED REDUCERS  
CANT SHAFTS - GEAR - CUT GEAR - V-BELT DRIVES  
REDUCERS - FLEXIBLE COUPLERS

### Company Earning Reports

**Island Creek Coal Co. and subsidiaries**—First 6 mo of 1952, net profit of \$1,712,997, representing \$1.38 per share of common stock after deduction of preferred stock dividends, compared with a \$2,648,362 net, or \$2.17 a share, in the same period of 1951. The company and its lessees produced 3,647,455 tons of coal in the 1952 period, against 4,257,459 in the first 6 mo of 1951.

**Pond Creek Pocahontas Co. and subsidiaries**—First 6 mo of 1952, net profit of \$861,836, or \$2.54 a share, compared with \$1,246,794, or \$3.67, in 1951. The company and its lessees produced 1,636,267 tons in the 1952 period; 1,679,166 tons in the same period of 1951.

**Philadelphia & Reading Coal & Iron Co. and subsidiaries**—First 6 mo of 1952, net income of \$1,001,064, or 71¢ a share, on net sales of \$34,369,946, compared with a net of \$1,319,431, or 92¢ a share, on net sales of \$34,402,170 in the same period last year.

**Pennsylvania Coal & Coke Corp.**—First 6 mo of 1952, net income, after depreciation and depletion, of \$153,454, or \$1.04 a share, compared with a net loss of \$10,819 after charges for depreciation and depletion in the same period of 1951.

**Truax-Traser Coal Co.**—Fiscal year ending April 30, 1952, net income of \$3,346,838 or \$2.95 per common share, compared with a net of \$4,025,823, or \$3.65 a share, the previous year. Output of the company's 16 mines for the year totaled 8,616,168 tons, against 9,017,965 tons the previous year.

**Pittston Co. and subsidiaries**—First 6 mo of 1952, net income of \$1,558,525, or \$2.45 a share, compared with \$506,460 or 83¢ a share, in the same period of 1951. Operating revenues were \$77,391,711, compared with \$46,243,291.

**Clinchfield Coal Corp. and subsidiaries**—First 6 mo. of 1952, net profit of \$884,598, or \$1.14 a share, compared with \$862,089, or \$1.15 per share, a year ago. Operating revenues were \$16,264,534, against \$14,478,898 last year.

### Back to the Mines for Oil

"Mr. and Mrs. America can't be expecting to be driving their car into town within the next few years on a fuel that used to be a lump of coal. But most people living certainly will do so," declares an article appearing in the latest *Koppers Magazine*. The growing importance of chemicals, the article states, will push the development of the industry along. "When such plants come, the effect on the U. S. coal industry will be enormous. Dr. A. R. Powell, associate manager of Koppers Research Dept., has done some serious study on this matter. His figures are based primarily on use of the gasification-type plants and their application to the production of chemicals. "Assuming that by 1975 gasification plants capable of producing 700,000 bbl of liquid fuel per day are in operation, such plants would use more than 150,000,000 tons of coal annually."

THESE BUILDINGS  
LOOK GOOD  
FROM ANY ANGLE

LOW COST



ADAPTABILITY

DURABILITY

LOW MAINTENANCE

Experienced mining men have found that Armco STEELOX Structures help solve many of their most troublesome building problems. Here are a few reasons why:

STEELOX construction is so simple that an unskilled crew can put up a building in a matter of hours. Installed costs are low even in remote locations.

Durability and low maintenance are assured because STEELOX Buildings are sturdily constructed of 18- and 20-gage Armco ZINGRIP-PAINT-GRIP Steel. There isn't anything to warp, rot or get out of order. An occasional painting is generally the only maintenance required.

All-steel construction also means

that STEELOX structures are fire-resistant and lightning-safe when properly grounded. The patented STEELOX joint assures complete weathertightness. What's more, should conditions change these buildings can readily be re-arranged, extended with standard parts or moved to a new site without loss of material.

You will find Armco STEELOX Buildings ideal for head houses, repair shops, offices, converter stations and other mining needs. Write for complete information. Armco Drainage & Metal Products, Inc., 1442 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

ARMCO STEELOX BUILDINGS

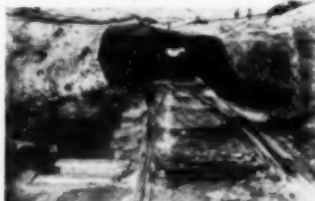


# West Virginia *gives you*

## 6 ways to reduce coal mining costs



**SWITCH STANDS**—Tops in design, tops in service, tops in quality and variety.



**TURNOUTS**—Economical in use, economical in cost, easy to install and maintain.



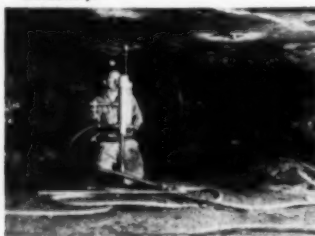
**STEEL TIES**—Standard designs and weights. Save labor, save height, make good track.



**RAILS**—In ASCE sections and any lengths, high quality rail steel for durability.



**PREFABRICATED TRACK**—For permanent and temporary installations, easy to install.



**ROOF BOLTS**—The greatest forward step in safety and economy in mining in years.

### And For Your Information . . .

A fire thought to have been caused by a welding operation 18 hr earlier destroyed the screening plant of the Peerless Coal & Coke Co at Vivian, McDowell County, W. Va., with damage estimated at \$100,000. The blaze, which raged for 4 hr, also threatened the company's new cleaning plant.

The Baltimore & Ohio R. R. Co. has placed orders for 62 additional diesel-electric locomotive units of 1,500 and 1,600 hp. When the orders are completed, the B.&O. will be able to handle about three-quarters of its normal business with diesel-electrics, the road reported.

Gunnison Valley Coals, Inc., composed of individuals representing communities throughout Delta County, has been established as a non-profit corporation to promote the coal resources of that section of Western Colorado. The group will work toward the location of a coal-hydrogenation or low-temperature-carbonization plant in the area.

The Texas Gas Transmission Corp. began early last month to build a \$33.7 million 408-mi pipe line that will carry an additional 950 million cubic feet of natural gas daily to homes and industries in an area from Louisiana to Ohio. The company announced plans for immediate construction 3 days after it had secured approval of the project from the ICC.

The expansion goal for coal production within the Territory of Alaska has been set by the Defense Production Administration at 950,000 tons annually by July 1, 1953, an increase of 400,000 tons over the current rate of 550,000 tons annually.

The Pennsylvania Coal & Coke Corp., last month announced that it had bought two additional 10,650-ton cargo vessels. The boats will continue their previous general cargo-carrying operations, including coal haulage, between West Coast ports and Pacific trade areas.

The preparation plant of the Borderland Collieries Co., near Williamson, W. Va., will be rebuilt immediately but mine production will not be resumed for several months, it was reported. The plant burned Sunday, Aug. 17, with a loss estimated at \$200,000.

### 34 Teams Participate in Uniontown Safety Meets

Topping a field of 30 teams, the Colonial Mine Team No. 1 of the U. S. Steel Co., captained by Stanley Skowranek, scored 99.95 to win a \$350 cash award, a plaque donated by the Mine Safety Appliances Co. and an American Flag in the first-aid contest held by the Southwestern Pennsylvania Association at Uniontown, Pa., Aug. 16.

In a separate meet held at the same time by the Allegheny-Kiski Safety and First Aid Association, Team No. 2 of the Renton Coal Co. placed first among the

**West Virginia Steel & Mfg. Co.**  
HARRISBURG, WEST VIRGINIA

Manufacturers of  
**RAILS and ACCESSORIES**  
**TRACK WORK**  
**STEEL TIES**



## Is this "Drip" necessary?

NO... oil leakage from hydraulic machines — now costing industry millions of dollars annually — *can be controlled!* Today, after two years of intensive study, Socony-Vacuum can help you solve this critical problem.

Here's what controlled leakage — plus high-quality hydraulic oils — will do for you... assure more continuous production, fewer rejects, reduced maintenance, less oil make-up, greater safety for plant personnel, peak machine efficiency. And with controlled leakage, the use of high-quality Gargoyle oils is more economical than ever.

Helping you control hydraulic leakage is just one of many cost-saving services which go with Socony-Vacuum Correct Lubrication. Why not call our representative today?

Send today for this important booklet — "Is Leakage Necessary?" Write: Socony-Vacuum Oil Company, Inc., 26 Broadway, New York 4, New York



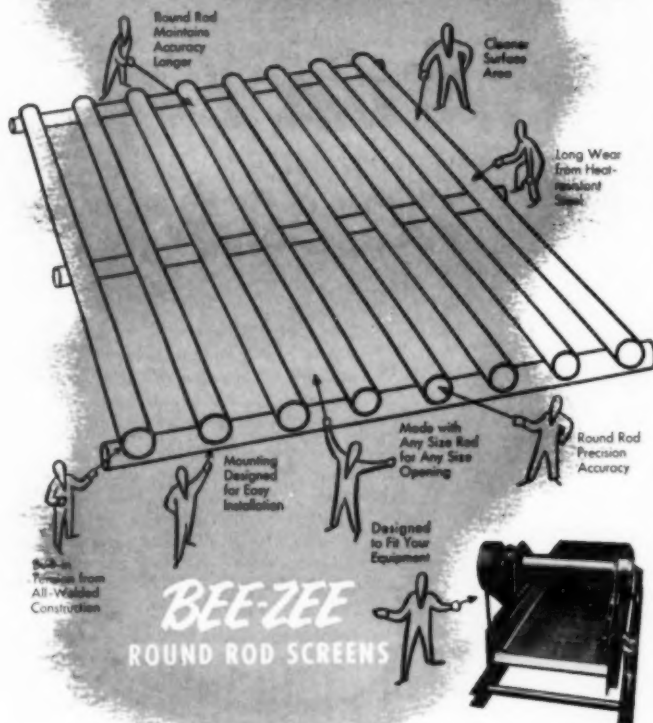
# SOCONY-VACUUM CORRECT LUBRICATION



SOCONY-VACUUM OIL CO., INC.  
and Affiliates:  
MAGNOLIA PETROLEUM CO.  
GENERAL PETROLEUM CORP.

WORLD'S GREATEST LUBRICATION KNOWLEDGE AND ENGINEERING SERVICE

# BEE-ZEE Exclusives FOR BETTER SCREENING



Whatever the screening job, Round Rod Screens

by Bixby-Zimmer produce better results...

last longer. Exclusive Round Rod design gives faster screening... non-blinding action - maintains accuracy even when worn half-way through!

Tell us your requirements.

*Write for Free Catalog describing BEE-ZEE screens*



**BIXBY-ZIMMER**  
*Engineering Co.*

192 ABINGDON STREET, GALESBURG, ILLINOIS

BEE ZEE SCREENS Can Be Fitted To Any Coal Processing Equipment

## Safety Milestones

The Leckie Smokeless Coal Co., operation at Anjean, W. Va., recently received a Certificate of Honor from the West Virginia Department of Mines for producing more than 1,000,000 tons without a fatality. The last fatality at the mine, which employs 198 men, was in October, 1948.

four teams participating with a score of 100.00, winning a cash prize of \$170, a MSA plaque and the privilege of competing in the state-wide meet Sept. 6.

Both meets were sponsored by the Pennsylvania Department of Mines, the USBM, UMWA and coal operators in the areas. An added feature of the evening was a mine-rescue demonstration by teams from the U. S. Steel Co. and the Pittsburgh Coal Co., Div. of Pittsburgh Consolidation Coal Co.

The seven runner-ups in the Southwestern meet, all of which will participate in the state meet, were in order of their ranking as follows: Banning mine, Republic Steel Co., Joseph Hutchinson, captain; National No. 3 mine, U. S. Steel Co., J. Ray St. Clair, captain; Robena slope, U. S. Steel Co., Gevion Shannon, Jr., captain; Emerald mine, Emerald Coal & Coke Co., Porter Remington, captain; Montour No. 10 mine, Pittsburgh Coal Co., A. J. Waggett, captain; Nemacolin mine, Buckeye Coal Co., George Walters, captain; and Allison coke yards, Hillman Coal & Coke Co., William Charles, captain. Cash prizes of \$210 to \$70 were awarded to these teams.

## W. Va. Mid-State Institute Holds Annual Safety Day

The Bolair mine team of the Pardee & Curtin Lumber Co. took first place in the first aid contest featuring the annual safety day held by the Mid-State (W. Va.) Coal Mining Institute at Camp Ceaser, Webster Springs, W. Va., last month. Second place went to the Mine No. 2 team of the Imperial Smokeless Coal Co. and third to the Donegan Coal & Coke Co. In the colored division, the Anjean team of the Leckie Smokeless Coal Co. was the winner. Speakers at the meet included representatives from Congress, USBM, UMWA and the NCA.

## 14 Teams Participate in North Central Pa. Meet

The team from Pine No. 1 mine of the Pine Township Coal Co., captained by Steve Stupic, scored 99.850 to place first among the 14 teams entered in the 10th annual first-aid contest sponsored by the North Central District Safety Association, at Indiana, Pa., July 19. A cash prize of \$350 and a plaque awarded by the Mine Safety Appliances Co. went to the winners of the meet, which was held in cooperation with the Pennsylvania Department of Mines, UMWA, North Central District coal operators and the USBM. Other ranking teams, which also will represent the district at the state meet, were: second, Penelec No. 5 mine, Pennsylvania Electric Co., John J. Kruk,



## SOLDERING ARMATURE COIL LEADS

# without a Soldering Iron?

Soldering armature coil leads to risers by hand leaves a lot to the human element. So three years ago, National developed a way to solder by induction heating. It's quicker.

More uniform. Reduces liability of premature trouble. If you've wondered why a motor or generator repaired or redesigned by

National gives such excellent service . . . it's the "little" things like this which National does, unheralded and unsung, that count so much. They mean a lot in the long run. Use National coils and engineering service for the unannounced advances which add so little to cost, so much to value.



Soldering armature coil leads to risers with National-designed induction heating equipment in the National plant.



## NATIONAL ELECTRIC COIL COMPANY

COLUMBUS 16, OHIO, U.S.A.

ELECTRICAL ENGINEERS; MAKERS OF ELECTRICAL COILS AND INSULATION—  
REDESIGNING AND REPAIRING OF ROTATING ELECTRICAL MACHINES



**Wear Protection  
by the  
BUCKET-FULL!**

Protect bucket lips, teeth, bucket sides and bottom with Stoodly Self-Hardening 21! A few stringer beads as cross-hatches do the trick on large areas. Combine stringers and solid deposits at concentrated wear points.

Stoodly Self-Hardening 21 provides excellent wear resistance, goes on fast and easy and makes heavy deposits in one pass. For these reasons *and because it's economically priced*, Stoodly Self-Hardening 21 is the ideal rod for heavy-impact, severe-abrasion.

See your Stoodly Dealer—600 in the U. S. and Canada—or write for complete welding procedures.

#### **STOODY COMPANY**

11943 E. SLAUSON AVENUE, WHITTIER, CALIFORNIA



**APPLICATION:** Apply Stoodly Self-Hardening 21 to dipper teeth on all sides 2" up from point. Extend stringers of Self-Hardening 21 up the balance of each tooth. Where abrasion is unusually severe but impact only moderate substitute Tube Borium for Self-Hardening 21 deposits on the point.

**STOODY**

Your Yellow Classified Telephone Directory lists your Stoodly Dealer under "Welding Equipment and Supplies". Ask him about Automatic hard-facing facilities in your locality.

# **SELF-HARDENING 21**

captain, 99,750; third, Lucerne mine, Rochester & Pittsburgh Coal Co., Leonard Dominick, captain, 99,601; and fourth, Kent Nos. 1 and 2 mines, Rochester & Pittsburgh Coal Co., William Thompson, captain, 99,600. Cash prizes of \$280, \$210 and \$140, respectively, were awarded to them. One visiting team and two Boy Scout teams also participated in the meet.

### National Safety Council Plans Broad Program

New developments and current problems in roof-bolting, rock-dusting, sealing abandoned workings, management-labor cooperation and ventilating gassy mines are among the many important discussion subjects that will highlight the coal-mining sessions of the National Safety Congress and Exposition to be held in Chicago, Oct. 20-24.

All sessions of the Coal Mining Section, Monday through Thursday, will be held in the afternoon in the Conrad Hilton Hotel. Papers to be presented, and their authors, include:

**Monday, Oct. 20**—"How the Bureau of Mines Accident-Prevention Course for Mine Officials Has Benefited Our Company," J. W. Pero, production manager, Pocahontas Fuel Co.; "Benefits of a Safety Campaign to a Mine," A. G. Gosard, general superintendent, Snow Hill Coal Corp.; "Practical Instruction in the Use of Gas-Detection Equipment," Frank T. Powers, director, board of natural resources, Dept. of Geology, Mine & Water Resources; "Results of a Study by Questionnaire of United Mine Workers' Views on Safety, District 1, UMWA," Michael J. Kosik, president, and Charles Kaczinski, safety director, UMWA, District 1.

**Tuesday, Oct. 21**—Address by Herb Graffis, columnist, Chicago *Sun-Times*; "Problems of Bumps and Outbursts in American Coal Mines," George B. Jackson, Carbon College; "Developments and Problems in Roof-Bolting Practice With Conventional Mining," L. H. Johnson, safety director, Peabody Coal Co.; "Developments and Problems in Roof-Bolting Practices With Continuous-Mining Machines," Milton H. Fies, manager of coal operations, Alabama Power Co.; "Responsibility for Roof-Fall Accidents," Ira P. Bradley, general superintendent, C. A. Hughes & Co.

**Wednesday, Oct. 22**—"Progress in the Development of Dry Dust Collectors," L. B. Berger, chief of health branch, USBM, Pittsburgh; "Effective Rock-Dusting in the Operating Cycle—Procedure," S. M. Cassidy, president, Consolidation Coal Co. (Ky.), Div. Pittsburgh Consolidation Coal Co.; "Effective Rock-Dusting in the Operating Cycle—Cost Factors," E. B. Nelson, general superintendent, Tennessee Coal, Iron & R.R. Co.; "Effective Ventilation of Gassy Mines," C. E. Linkous, director of safety, Island Creek Coal Co.

**Thursday, Oct. 23**—"Inter-related Safety Requirements for Ventilation, Haulage and Electrical Installations to Prevent Gas Ignitions," D. S. Kingery, coal-mine-haulage safety section, USBM, Washington; "Roof Control in Longwall

**PANGBORN DUST CONTROL**  
**HERE**  
**makes Coal Dust BEHAVE!**

Floating coal dust in your plant costs money! If you want to save that money, do as scores of high-profit coal preparation plants do—make coal dust behave with Pangborn Dust Control!

Efficient Pangborn Dust Control gives you superior (and more profitable) reclamation. Machinery lasts longer, explosive hazards are reduced, working conditions improved because Pangborn stops dust from tipples, dry cleaning, dedusting and many other operations.

If you're now losing profits from faulty reclamation, high machinery maintenance or excessive dust conditions—call on Pangborn. A free *Dust Pocket Survey* costs you nothing, but may show how Pangborn Dust Control can earn profits for you!

**GET THE FACTS!** Write today for your free copy of Bulletin 909A. Just address: PANGBORN CORPORATION, 2800 Pangborn Blvd., Hagerstown, Maryland.

Look to Pangborn for the Latest Developments in Dust Control and Blast Cleaning Equipment.

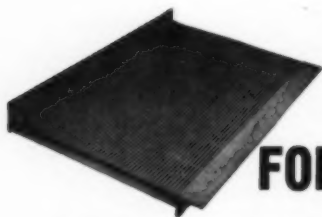


**STOP THE DUST HOG**

from stealing profits with

**Pangborn**  
**DUST CONTROL**





## Stand up FOR 14 MONTHS

For the dewatering and sizing of fines and very small sizes of coal, the Sunnyhill Coal Company, at its New Lexington, Ohio, preparation plant, uses stainless steel Hendrick Wedge-Slot Screens on a double-deck vibrator.

Because of their great resistance to abrasion and corrosion, the stainless steel top deck screens have shown a service life of fourteen months. During this time none of the twenty-one sections in the deck

required replacement, although 80,000 tons of coal passed over them.

These stainless steel Wedge-Slot screens replaced other types, in which blinding interfered with continuous operation.

Hendrick Wedge-Slot Screens are available with bars of various profiles to meet the specific requirements of different dewatering and sizing operations. Write for detailed information.



Perforated Metals  
Perforated Metal Screens  
Wedge-Slot Screens  
Architectural Grilles  
Milco Open Steel Flooring,  
Shor-Site Treads, Armorgrids

# HENDRICK

*Manufacturing Company*

41 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities



*Millions of Contacts  
without Faltering*

## PROVED

**ON ROUGH, TOUGH JOBS**

WITHSTANDS

HIGH

TEMPERATURES

Durakool pressurized all-steel mercury tilt switches have more than made good on what may have seemed like extravagant claims a few years ago. The list of Durakool successes grows each year. Seven sizes, 1 to 65 amperes. 3 to 4 weeks delivery. Your production schedule is met.

See telephone directory for local distributor or write  
DURAKOOL, INC. — Elkhart, Indiana

# Durakool

**ALL-STEEL  
MERCURY  
Switches**

Mining," R. T. Todhunter Jr., general manager, Barnes & Tucker Co.; "Advantages of Sealing or Not Sealing Abandoned Workings," William J. Johnson, assistant director, Illinois Department of Mines and Minerals.

## Oil Industry, USBM Still Battle on Synthetic Gas

Statements circulated in April misled the public into believing that the Ebasco study of USBM coal-hydrogenation cost figures concluded that industry could finance, build and operate a plant that could produce synthetic gasoline equal to today's motor fuel at a competitive refinery price of about 12c a gallon, the National Petroleum Council reported Aug. 1. In presenting the analysis of its Committee on Synthetic Liquid Fuels Production Costs of the report prepared for the Bureau by Ebasco Services, Inc., the NPC said that Ebasco pointed out that to make the venture attractive a return of about 15% after taxes should be realized, which would result in a gasoline cost of 28c a gallon, even with large revenue from the sale of chemicals.

Actually, the Council pointed out, the Ebasco report also said that "We do not believe it would be feasible to finance the projects . . . with private capital under conditions prevailing at Jan. 1, 1951." Its own study, costing a half-million dollars, has placed the actual manufacturing cost of synthetic gasoline at 41c per gallon, the Council reported. This, however, would be for a true synthetic-fuels plant, and not one where synthetic fuels are a by-product of a chemicals operation. This point is the major factor of difference between the Bureau and the oil industry in arriving at an estimated cost. The NPC emphasized that the expected 53% of the income of the Bureau's projected plant from the sale of chemicals, as reported by Ebasco, would be too large as result of the overproduction of chemicals when supplying even a moderate percentage of the nation's fuels. The Council also said that the Ebasco report actually covered only 25% of the over-all investment cost, that it was restricted to using the Bureau's estimates and that at the request of the Bureau, Ebasco did not see the lengthy studies on hydrogenation made by the Council.

The day previously, Oscar L. Chapman, Secretary of the Interior, again reiterated his previous recommendation that private industry, with such government assistance as may be available, proceed to construct pioneer commercial plants to produce synthetic liquid fuels from both oil shale and coal. Mr. Chapman's statement was made in his annual report to Congress on technical advances in synthetic liquid fuels techniques. "Sooner or later," the report said, "our Nation will rely in part on synthetic liquid fuels, and from the standpoint of national security it is essential that we be fully prepared when the time comes."

Editor's Note—More information on Mr. Chapman's two-volume report and how to secure free copies will be found in the "New Books for Coal Men" section beginning on p 192 of this issue.

# "TENOL CUTS OUR OPERATING COSTS"



## "Saves us Wasteful Downtime"

Says McCoy Coal Co., Jasper, Alabama

The McCoy Coal Company moves 150,000 cubic yards of rock a week in its strip mining operation. It takes 9 excavators, 6 tractors and 5 dump trucks working at peak efficiency to maintain this scale of operations.

Sinclair lubricants play an important part in the prolonged life and the producing-power of the McCoy equipment. Exclusive use of Sinclair TENOL, for example, has proved its value in actual money and time saved. Mr. McCoy, president of the company says:

"We've used TENOL in our shovels, drag lines and tractors for 7 years. In that time, we've mined over 1,200,000 tons of coal and we've found that TENOL is an outstanding engine oil. It has saved us a lot of wasteful downtime . . . slashed our operating costs by cutting repairs. We've run engines as long as 5 years before breaking them down . . . they all were clean. We're more than satisfied with our rate of consumption — it's remarkably low. TENOL has had some tough tests with us . . . it's tops"

Let Sinclair help with your lubrication problems. Contact your nearest Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.



J. V. McCoy, President

**SINCLAIR TENOL®**  
*for Prolonged Engine Life*





At the Trail, British Columbia, Lead and Zinc Mine, owned and operated by The Consolidated Mining and Smelting Co. of Canada, Ltd.

**DUMPING 5 CARS  
IN 5 SECONDS**



**DIFFERENTIAL PRODUCTS INCLUDE**  
Locomotives, Mine Cars, Mine Supply Cars, Rock Larries, Mantrip Cars, Air Dump Cars, Dumping Devices and Complete Haulage Systems.

### WITH THE DIFFERENTIAL ROTARY DUMPER

It's everyday procedure at this Canadian lead and zinc mine. A touch of the air control starts the dumping action and the law of gravity takes over. It's as simple as that!

Simplicity in design, speedy operation, low upkeep, safety, low initial cost and ease of erection . . . these are some of the reasons why you are seeing more and more single and multiple Differential Dumpers in the mining world.

*Our engineering service is at your service!*

**DIFFERENTIAL STEEL CAR  
COMPANY**

FINDLAY, OHIO

**SINCE 1915 — PIONEERS IN HAULAGE EQUIPMENT**

### COAL MEN ON THE JOB . . .

**TIOGA COAL CORP.**, Tioga No. 5 mine, Nicholas County, West Virginia (left photo): Stanley M. Deal (standing, left), superintendent; Harvey Black and Oliver Barnett, section foremen; Russell Sydenstriker, fireboss; Ben Taylor (seated, left) and Nash O. Moore, section foremen; and W. J. Lively, mine foreman.

**GULF SMOKELESS COAL CO.**, Tams, W. Va. (right photo): H. E. Cook (left), tippie foreman; J. T. Tobin, chief engineer; and W. A. Hartley, outside foreman.



**"Crackin'  
Good"**

**FOR 26 YEARS**

The most durable  
Brattice Cloth you  
can buy—yesterday,  
today and tomorrow!

**ABC  
BRATTICE  
CLOTH**

**AMERICAN BRATTICE CLOTH CORP.**  
200 South Buffalo Street Warsaw, Indiana

## In transportation...



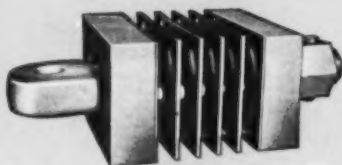
Willison Automatic Couplers



National NC-1 Truck



National M-225 Rubber-Cushioned Draft Gear



National M-230 Rubber-Cushioned Draft Gear

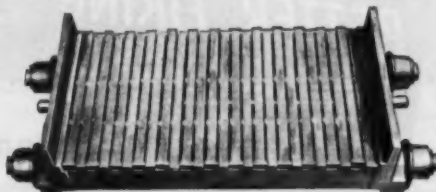


Naco Steel Swivel Hitching and Link

## In processing...



Ore-Grinding Balls



Cast Steel Pallet and Mallix Sintering Bars

## NATIONAL equipment cuts per-ton costs

Decades of experience combined with resourceful and advanced engineering have placed NATIONAL in the forefront as a producer of mine and industrial equipment for increasing safety at reduced per-ton cost.

New National NC-1 Trucks provide a smoother ride that results in less wear on cars . . . reduces impact on roadbed . . . minimizes spillage. Willison Automatic Couplers give maximum safety . . . speed up coupling, gathering and shunting . . . reduce surging, spilling and danger of derailment. National Rubber-Cushioned Draft Gears provide smooth cushioning action that reduces shock and protects equipment.

National Cast Steel Pallets and abrasion-resistant Mallix Sintering Bars last longer . . . reduce equipment down time.

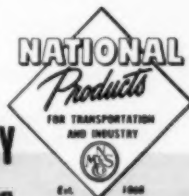
Capitol Foundry Co. and Arizona Iron Works of Phoenix, and Rotary Steel Castings Company of Denver, National subsidiaries, produce castings for mining and milling equipment and specialize in the manufacture of grinding balls.

Specify National products—handle larger daily tonnages at lower per-ton cost.

A-1249



National Products will be on display at the Mining Show Denver, Sept. 22-25



## NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

Cleveland 4, Ohio

Willison Automatic Couplers • Friction & Rubber Draft Gears • Car Trucks • NACO Steel Wheels • NACO Steel Links & Swivel Hitchings



when COAL is treated with

# **Ashland** PERMATREAT COAL SPRAY

You have all these advantages when stoker and industrial grades of coal are treated with PERMATREAT COAL SPRAY. Handlers approve its cleanliness, whether firing, conveying to and from stockpiles, or transferring from loaded cars to lake boats for re-shipment. Fines do not settle in the car or stockpile; degradation is minimized; water runs off faster. This oil-treated coal does not lose its dust-proof and freeze-proof characteristics even under extreme weather conditions.



**ASHLAND OIL & REFINING COMPANY**

Ashland, Kentucky

## Among the Manufacturers



### Mobile Power Offered for Emergencies

CATERPILLAR TRACTOR CO., Peoria, Ill., will lend its 28-ton "power plant on wheels" to any community where interruption of normal electrical service creates a need for temporary power to run public facilities. Developed specifically for community service in the wake of storms, floods, fires and other disasters, the new emergency unit consists of a 500-hp Caterpillar diesel engine driving a 315-kw generator to produce 2,400 or 4,160 v, mounted in a van-type truck-trailer that is completely self-contained, even to its own radio-telephone. During its demonstration tour in the East, the unit saw service in July in a New Jersey community where power was impaired by a breakdown in the municipal generating station.

Anaconda Wire & Cable Co., New York, has named R. B. Steinmetz vice president in charge of manufacturing operations; and L. R. Love vice president in charge of sales. Mr. Steinmetz was formerly general manager of mills, and Mr. Love general sales manager. D. E. Allen, with the company since 1932 in various sales and engineering capacities, has been made general sales manager to succeed Mr. Love.

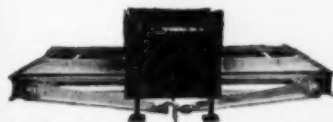
J. L. Reid has been appointed district manager of Goodyear Tire & Rubber Co.'s mechanical goods sales at Salt Lake City, replacing W. T. Roberts, who retired July 1 after 32 yr of service. With the company since 1942, Mr. Reid formerly was a field representative in Salt Lake. Mr. Roberts had served Goodyear's mechanical goods division in the Northwest from the time he joined the firm as a trainee in 1920.

Wagner Electric Corp., St. Louis, has appointed A. Callaway Allen sales manager of its electrical division to succeed H. A. Hudson who has been named a sales analyst for the company. Mr. Allen began his career with Wagner in 1930 and formerly was manager of the electrical sales branch at Memphis.

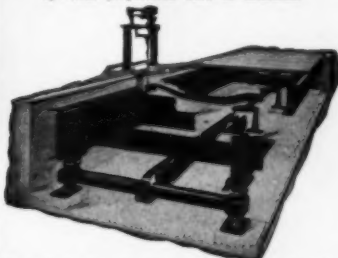
Allis-Chalmers Mfg. Co., Milwaukee, has announced organization of a field group to provide customers of its general machinery division throughout the country with a maximum of fast and efficient service. The newly organized group is operating under the direction of C. W.

## WINSLOW

Dependable — Accurate  
TRUCK and TRACTOR TRAILER  
SCALES



TYPE "C. S." Portable Scale—easily and quickly set up—with preparation held to minimum



TYPE "S" Platform Scale—for weighing trucks and tractor trailers—Platform lengths 18 ft. to 60 ft. inclusive.

**WINSLOW SCALE COMPANY**  
TERRE HAUTE 1, INDIANA  
Scale Manufacturers since 1896

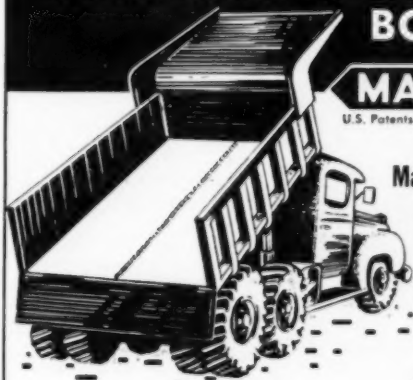
## Reduce Downtime ON TRUCK BOTTOMS!

**MANGANAL**

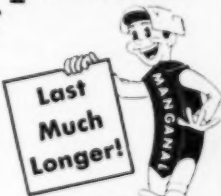
U.S. Patents 1,876,738 - 1,947,167 - 2,021,945

11% - 13½%  
Manganese-Nickel Steel

**HOT ROLLED  
PLATES**



- Tensile strength to 150,000 p.s.i.
- Workhardens under impact and abrasion to 550 Brinell.
- Can be rolled or bent — hot or cold.
- Far outlasts new truck bottoms.
- MANGANAL is the toughest metal known not harmed by heat.



**FREE**  
Literature on latest  
methods for speedy  
and economical repair  
of worn equipment.  
•  
NEAREST DISTRIBUTOR  
UPON REQUEST

**STULZ-SICKLES CO.**

SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.



**I'LL BETCHA  
\$50,000**

**YOU CAN SAVE UP TO 25¢ PER TON WITH  
OSMOSE  
TREATED MINE TIMBERS**

This may sound like a sucker bet, but don't take the guy up on it because we can **PROVE IT** in one year. Here's how **YOU CAN WIN** the \$50,000! If you deep-mine 200,000 tons of coal annually, **YOU** can save your company 25¢ per ton or \$50,000 per year by switching to **OSMOSE TREATED MINE TIMBERS NOW!** No matter how you get them (see the 3 deals below) Osmose Treated Mine Timbers are impervious to all types of rot, decay and termites and **LAST UP TO FIVE TIMES LONGER!** Mine timbers are **EXPENSIVE** today, but when you compare this cost with the cost of **REPLACEMENT LABOR**, you begin to see why Osmose can save you such a tremendous amount. Comparable savings are possible for larger or smaller tonnages. We are **VETERANS** in the coal mining field and have been specialists in Mine Timber problems for years! **NO OTHER Mine Timbers, NO OTHER Mine Timber Treating Process, NO OTHER Treating Material can SURPASS or even EQUAL OSMOSE** in mine effectiveness or **APPROACH OSMOSE** in **ECONOMY.**

**ALSO . . . Ask us about M-T-M (Mine Timber Mix) for spot application.**

### **3 DIFFERENT WAYS TO SAVE**

#### **2 We will CUSTOM-TREAT timbers furnished by you**

We will Osmose-treat your own timber at our nearest treating plant. Remember, this treatment can be applied to **ANY** wood species, even beech, gum, hickory, ash, elm and maple.

#### **1 We can furnish you with OSMOSE TREATED TIMBERS**

We can supply you with Osmose-treated square-sawed, slabbed or round timbers, ties, collars, posts, lagging, caps, wedges or upple timbers from one of our treating plants. These select Osmose-treated timbers will render many years of **EXTRA** service.

#### **3 We will furnish materials and you can treat your own timber** By constructing an inexpensive vat and following directions, you can treat your own green timber with **OSMOSALTS.**

**WRITE FOR COMPLETE DETAILS** on the type of Osmose service you prefer

**OSMOSE WOOD PRESERVING COMPANY OF AMERICA, INC.**  
BUFFALO 12, NEW YORK

Representatives in: Pittsburgh, Denver, Birmingham, Ala., St. Louis, Mo., Cincinnati, W. Va., and New York City

### **"Man-Bites-Dog" Note . . . Manufacturer Reduces Prices Of Quonset Buildings**

A reduction in prices on its line of prefabricated buildings for mining, industrial housing and other uses below those in effect since Dec. 1, 1950, was announced last month by the **Stran-Steel Div., Great Lakes Steel Corp., Detroit, Mich.** The lower prices, which are reportedly based on improved manufacturing efficiency as a result of increased volume, will enable dealers to reduce selling prices of erected **Quonset** an average of about 10%, the company said.

Schweers, vice president and director of sales, and will handle all service, repairs, breakdowns and adjustments in the field. Regional service supervisors named under the new setup are: B. F. Ureda, Chicago, midwest region; A. S. Hill, Cleveland, central region; D. T. Thomas, New York, empire region; C. P. Suykerbuyk, Atlanta, southeast region; E. G. Kime, Dallas, southwest region, and D. W. Seagrave, San Francisco, Pacific region.

**Jeffrey Mfg. Co., Columbus, Ohio,** has announced several changes in its district personnel. Carl Verhine, of the Columbus office, has been added to the Milwaukee sales staff; J. A. Lowry has been transferred from New York to the home office; and Elmer Longnecker moves to Detroit from the Columbus district office, replacing Robert Monsarrat, named manager of the Philadelphia district office.

An agreement for the reorganization of the **LaPlant-Choate Mfg. Co., Cedar Rapids, Iowa,** as a part of the **Allis-Chalmers Mfg. Co., Milwaukee,** has been approved by the directors of both companies. Approval of the stock-exchange plan by **LaPlant-Choate** stockholders will broaden the industrial line of the **A-C Tractor Div.** in earthmoving and other fields and will make the **Cedar Rapids** plant the 11th U. S. plant for **Allis-Chalmers,** now in its 104th year. **Allis-Chalmers** contemplates the continued operation of facilities at **Cedar Rapids** with the present organization.

**New York Belting & Packing Co., Passaic, N. J.,** has joined forces with the **L. H. Gilmer Co.,** with the new organization continuing to operate as **New York Belting & Packing Co.** **Gilmer** products will retain the **Gilmer** name and will be sold by the new organization, which will be in charge of **B. F. Ruether,** vice president of **New York Belting & Packing.** The company has named **C. A. Franklin Jr.** western district sales manager for the territory from the **Rocky Mountain** states to the **West Coast,** succeeding the late **O. L. Wall.**

**Ansul Chemical Co., Marinette, Wis.,** has named **Paul R. Larimer** general sales manager in charge of all four sales divisions—fire extinguishers, refrigeration, industrial chemicals and export—a new post created to help supervise and coordi-



at New Orient No. 3 Mine...

**American** ROLLING RING CRUSHERS  
WILL REDUCE 600 TONS PER HOUR!



**Nine Time Winner!**

Yes, for the ninth time, American Rolling Ring Crushers have been delivered to the mines of Chicago, Wilmington & Franklin Coal Co.

The latest is the modern Orient #3, at Waltonville, Ill., where two American AC-3C's have been installed. One crusher will reduce ROM in the Portal Plant; the other will reduce 6"x2" clean coal to a minus 1" product.

The Management of Orient #3 knows from past experience, as do hundreds of other mine operators, that American Rolling Ring Crushers are dependable, consistent producers, requiring minimum maintenance, and operating at low cost.

**Americans** are  
**CRUSHING COAL**



**FOR LESS THAN  
1¢ PER TON!**

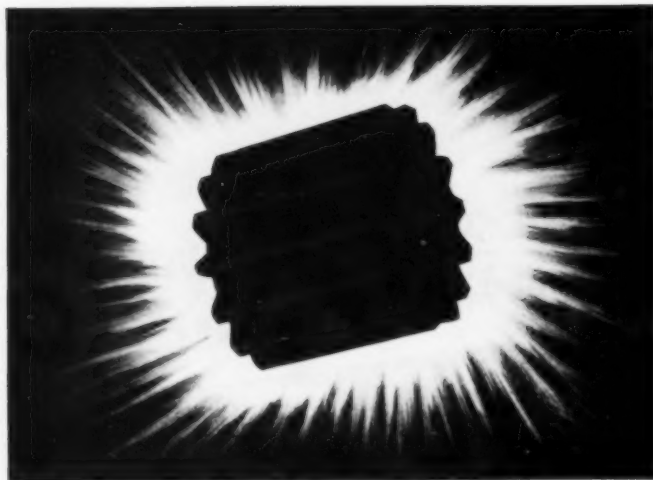
Costs include depreciation,  
repairs, maintenance power, and  
interest on investment.

GET THE COMPLETE STORY ON AMERICAN  
CRUSHERS. WRITE TODAY.

**American**  
Originators and Manufacturers of  
Ring Crushers and Pulverizers

**PULVERIZER COMPANY**

1119 Macklind Ave.  
St. Louis 10, Mo.



## This Pittsburgh Purple **ARMORED** Gear might save you a good many dollars

Increasing gear life may be a real problem for you but it's our business. It is something we do by combining design, metal, and machining with a special heat-treating process and experience we have gained making quality gears since 1914.

The PITTSBURGH Armoring process puts the right hardness in the right places. It makes the wearing surfaces hard but leaves the core tough and shock-resistant. **Armored Gears** are so good that we guarantee them to give you longer service.

✓ Your PITTSBURGH GEAR distributor will give you more information and names of operators near you who have used **Armored Gears** for years. He stocks standard renewal gears and parts that will save you money. Write us for his name.

Look for the "Pittsburgh Purple" protective coating on the gears you buy.

**GEARS  
and  
PARTS  
for  
LOADERS  
CUTTERS  
LOCOMOTIVES  
ETC.**

*Your  
Guarantee  
of  
Longer Life*



**PITTSBURGH GEAR**  
COMPANY

27th & Smallman Streets  
Pittsburgh 22, Pa.  
Phone: ATLantic 1-9950

subsidiary of BRAD FOOTE GEAR WORKS, INC. • CICERO 50, ILLINOIS

nate the company's sales expansion. Mr. Larimer formerly supervised the company's government relations program and served as assistant sales manager of the fire extinguisher division.

The Richardson Tractor Co., Kanawha City, Charleston, W. Va., has been appointed distributor for Bucyrus-Erie ½-to 4-yd gasoline, diesel and single-motor-electric convertible excavators, Red Arch dragline buckets and the Hydrocrane, the manufacturer reports. The new Bucyrus-Erie distributor's territory includes the state of West Virginia, except Hancock, Brooke, Ohio and Marshall counties, plus the three most westerly counties of Maryland—Garrett, Allegany and Washington.

The Frank G. Hough Co., Libertyville, Ill., has assigned two new district representatives to replace Jim Suter, who has become associated with Cornhusker Tractor & Equipment Co., Hough distributor at N. Platte, Neb. Dan Daily will headquarter at Minneapolis, with a territory comprising the states of North and South Dakota, Minnesota, Iowa, Wisconsin and Upper Michigan. Dick Lewis, operating from Kansas City, Mo., will cover western Missouri, Wyoming, Nebraska, Kansas and Colorado.

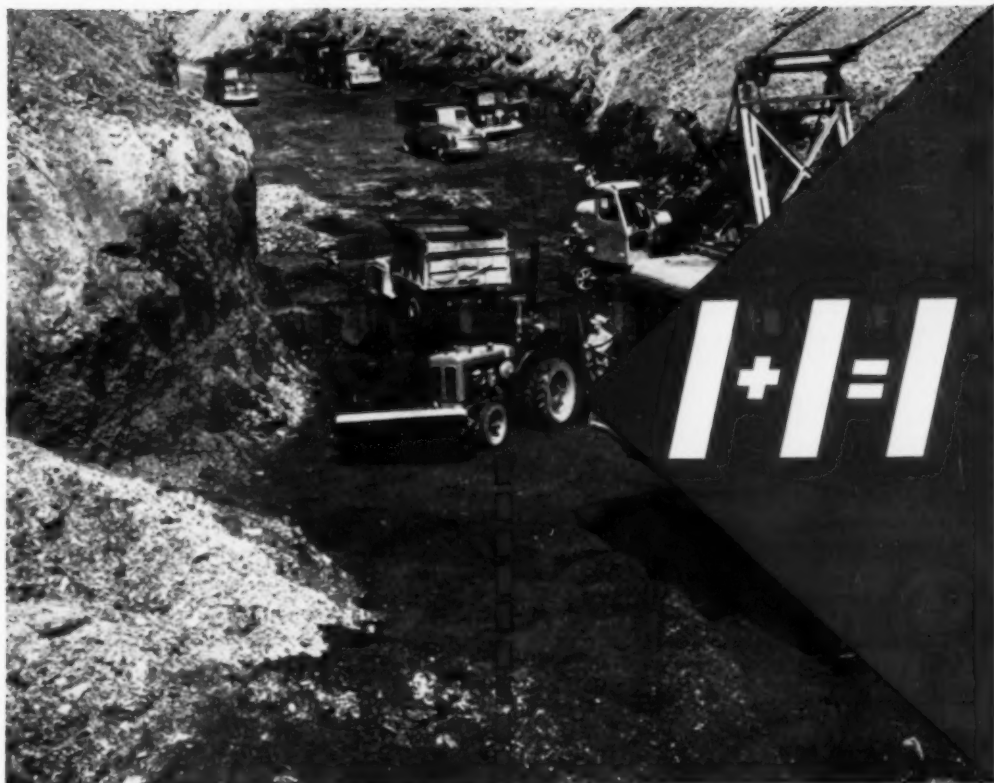
W. A. Finn has been named assistant general sales manager, Worthington Corp. With the company since 1926, Mr. Finn, formerly general European manager, will make his headquarters at the company's Harrison (N. J.) offices. F. E. Feltier has been appointed manager of the Worthington central regional engineering and service, Cleveland, with supervision of engineering and service in the company's district office territories of Detroit, Cleveland, Cincinnati, Buffalo and Pittsburgh.

Horace D. Moulton, vice president-operations, U. S. Steel Products Div., has been appointed assistant vice president-raw materials, United States Steel Co., with headquarters in Pittsburgh. Mr. Moulton joined U. S. Steel in 1939.

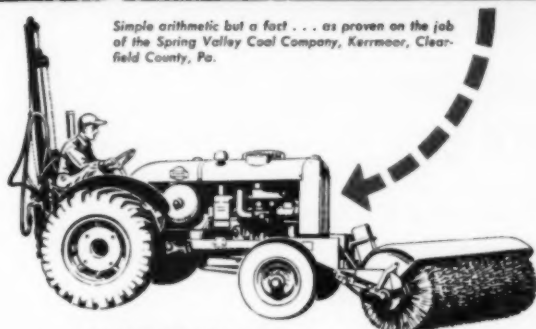
A. B. Fisher Jr. has been appointed a vice president in the Engineering and Construction Div., Koppers Co., Inc., Pittsburgh, where he will serve as executive assistant to the general manager and assistant general manager of the division.

Allis-Chalmers Mfg. Co., Milwaukee, has purchased the 127,000-sq ft plant of Victor Electric Products, Inc., in Cincinnati, Ohio. J. L. Singleton, vice president in charge of the general machinery division, has announced. Purchase of the plant fills a long-felt need for additional space and shipping facilities for Texrope-drive equipment. Mr. Singleton said, and within the next few months all Texrope sales, engineering and production facilities will be moved from W. Allis into the new plant.

Syntron Co., Homer City, Pa., has organized a Canadian subsidiary, Syntron Ltd., and purchased a manufacturing plant in Stoney Creek (Hamilton area), Ontario. Although ultimately the entire line will be manufactured in the Stoney



Simple arithmetic but a fact . . . as proven on the job of the Spring Valley Coal Company, Kerrmoor, Clearfield County, Pa.



The **SCHRAMM Pneumatractor** will:  
**PUSH** anything a wheel tractor will push  
**PULL** anything a wheel tractor will pull  
**POWER** anything a wheel tractor will power  
**PROVIDE AIR** for any pneumatic tool that can be operated from a 105 cu. ft. air compressor

A typical coal stripping operation with the SCHRAMM 105 *Pneumatractor* equipped with a steel brush capable of sweeping dirt or overburden to a depth of 2' in one pass. Also a SCHRAMM Pneumafeed mounted on the rear of the *Pneumatractor* providing a self-propelled, self-powered wagon drill with a 7' feed for the operation of drill steels in 6' changes. An ideal drilling rig mounted so that it can be used for drilling vertically down, horizontally, vertically up, or at any intermediate angle.

The real significance of  $1 + 1 = 1$  can be appreciated when you realize that the SCHRAMM *Pneumatractor* combines all of the features of 1 portable 105 c.f.m. air compressor plus 1 four wheel industrial type tractor. One unit requiring only one operator, one supply of fuel, one set of service parts.

For complete details write for . . . Bulletin NEU-52. There is also available for your own private showing, a color, sound, animated picture showing the SCHRAMM *Pneumatractor* and equipment in action.

**SCHRAMM, INC.**

*The Compressor People*

WEST CHESTER • PENNSYLVANIA

**SCHRAMM AIR COMPRESSORS**

# FOR DEPENDABLE GATHERING and MAIN HAUL SERVICE **ATLAS** IN SMALL MINES 3-TON TYPE F



Shown 30" high, but  
can be made 24" high.

The Type-F locomotive is no bigger than the average mine car. It can go anywhere in the mine without brushing. Built like a big trolley locomotive with two motors, one driving each axle. Users say they are the best in the world.

- Low Maintenance!
- Unequalled Performance!



## THE ATLAS CAR & MFG. CO.

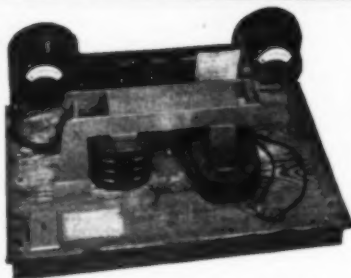
ENGINEERS

MANUFACTURERS

1140 IVANHOE RD.

CLEVELAND 10, OHIO, U. S. A.

## Cut Repair Costs!



## Flood City FIELD COIL TESTING MACHINE

**Quickly and positively locates faults in  
field and armature coils**

Simple to operate, the Flood City Field Coil Testing Machine provides a quick means of locating faults in field and armature coils. With series coil under test even a single short circuited turn instantly registers on the ammeter. Shunt fields are tested by measuring the induced voltage as compared with that of a standard coil.

**FLOOD CITY**  
BRASS & ELECTRIC CO.

JOHNSTOWN, PA.  
Branch Office  
Charleston, W. Va.

Creek plant, selenium rectifiers will be the first product to be made when production starts in the next month or so, the company reports.

The Rome Cable Foundation, Inc., created last March by the Rome Cable Co., Rome, N. Y., has announced the establishment of scholarships for study in the fields of science, engineering or business administration at Cornell University. The Foundation, which plans a coordinated program of philanthropic, educational and research activities, has appropriated \$2,500 for the scholarships this year, and up to \$5,000 for next year. Applications for the scholarships are accepted from boys graduating from the high schools in Rome, N. Y., and from sons of employees of the Rome plant graduating from any school. Five June graduates of the Rome Free Academy were the first recipients.

## New Books for Coal Men

### Profits From Flyash

Utilization of Fly Ash, by R. E. Morgan. USBM, I. C. 7635. This booklet summarizes 37 articles on fly ash recovery and utilization and presents the findings of leading engineers and experts in private industry. Aim is to help plants dispose profitably of the increasing quantities of fly ash that city ordinances are forcing them to collect. 8 x 10 1/2-in; paper; mimeo. Free, Publications Distribution Section, Pittsburgh 13, Pa.

### New Steps in Synthetic Fuels

Oil From Coal (R. I. 4865) and Oil From Oil Shale (R. I. 4866). Here's the latest word in the government's synthetic liquid fuels program that started in 1944. Summarizing advances in the past year, Interior Secretary Chapman reports the following: putting into operation a new process for making liquid fuels from synthesis gas; completing cost studies for commercial-size coal-hydrogenation and oil-shale plants; gasifying powdered coal with oxygen under pressure on a pilot-plant scale; and starting construction of a 300-tpd oil-shale retorting plant. Mr. Chapman concludes that it now would be prudent for private industry to build a commercial shale-to-oil plant. He recommends also that private industry, with government help, begin building pioneer coal-to-oil plants. 2 vols. 8 x 10 1/2-in; paper; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

### Making Shuttle Cars Safe

Recommendations for Improved Shuttle-Car-Haulage Safety, by D. S. Kingery. I.C. 7638. This booklet lists the eight major types of shuttle-car accidents and, based on suggestions of over 200 federal mine inspectors, makes 39 recommendations for reducing such accidents. The publication is another addition to the Bureau's new Haulage Safety Training Program. 10 pp. 8 x 10 1/2-in; paper; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.



THE SPOTLIGHT'S ON...

# THE "BIG THREE"

## 3 OF THE FINEST COAL CUTTING BITS EVER OFFERED

For years, "CINCINNATI MINE" has occupied the spotlight in the design and production of improved cutter chains and bits. First came the famous reversible, double-edged DUPLEX BIT... then the smaller but similar STANEX BIT... and now the best in carbide tipped bits... the new CINCINNATI CINIDE BIT.

THE PRIDE OF THEM ALL...

### CINCINNATI DUPLEX BIT

The reversible DUPLEX BIT as well as the DUPLEX TIPPED BIT... available in various grades to meet all cutting conditions, and made of high-quality alloy tool steel with keen cutting edges... is the ultimate in design and low-cost efficient performance. Bits are quickly and securely set... cut more tons of coal per shift... give coarser cuttings... reduce power consumption and maintenance cost on mining machines.



### THE STANEX BIT

A SMALLER BUT WORTHY COMPANION OF THE WORLD-FAMOUS DUPLEX BIT

Where cutting conditions are not too severe, the STANEX BIT along with the Stanex Bit Holder and the Stanex Cradle is designed to give you some of the advantages of the DUPLEX BIT... advantages such as modern, reversible, factory heat-treated bits in mines using 1/2" x 1" bit cutter chains. Light in weight, the STANEX BIT is particularly popular in thin seam conveyor mining where transportation is a problem.



*The*

**CINCINNATI  
MINE MACHINERY CO.**

CINCINNATI 25, OHIO

### THE NEW CINIDE BIT

The CINCINNATI CINIDE BIT, now available for use in chains accommodating 1/2" x 1" bits, combines the abrasion-resistance of tungsten carbide with the strength of forged shanks of heat treated alloy steel. Shanks are selectively hardened to give greater resistance to bending plus maximum support for the cemented carbide tip. Front portion of shank remains tough but not so hard as to prevent adequate set screw penetration to insure positively-held bit. Made in various combinations of bit gauge and shape. Write for catalog sheet.







## HUBBARD MINE ROOF BOLTS

### WEDGE-NUT STYLE

Easier to install...  
More head room...  
Greater safety...

Exhaustive tests have proven that Hubbard Mine Roof Bolts meet all requirements for mines where roof bolting is practical.

The Hubbard Wedge-Nut Style Mine Roof Bolt is easily installed without the use of special equipment. The full square head, without chamfering, eliminates slipping of wrenches, saves time.

The only head room required for the Hubbard Mine Roof Bolt is the thickness of the bolt head plus the plate. Freedom of movement, for men and equipment, improves working conditions, increases output.

The design of the Hubbard Mine Roof Bolt is simple and fool proof. The wedge-nut consists of two diagonally separated sections. As the bolt is tightened the two sections move one against the other with a wedging action, spreading both parts against the walls of the hole. The wedge so formed takes a biting grip over its entire length that holds for keeps.

Hubbard Mine Roof Bolts are  $\frac{3}{4}$ -inch diameter. They are furnished in any desired length. Usual installation practice employs plate washers 6-inches or more square (not included). Write for additional details.



Patents Applied For



HUBBARD ROOF BOLT COMPANY

13th Street and Gayan Ave., Huntington, W. Va.

"Have the best on Hubbard Hardware!"

### Planning a Drainage Tunnel

Core Drilling at Shaft Sites of Proposed Mine-Water Drainage Tunnel, Anthracite Region of Pennsylvania, by S. H. Ash, R. E. Doherty, P. S. Miller, W. M. Romischer and J. D. Smith. USBM, Bulletin 513. Here's the story on 15-diamond-drill holes along the line of a proposed drainage tunnel from near Glen Lyon, Pa., to the Susquehanna River below Conowingo, Md. The tunnel, if built, would drain water that threatens to flood anthracite mines. Data from drillhole logs support the view that the proposed route is feasible. 30c, Supt. of Documents, Government Printing Office, Washington 25, D. C.

### Electrifying Railroads

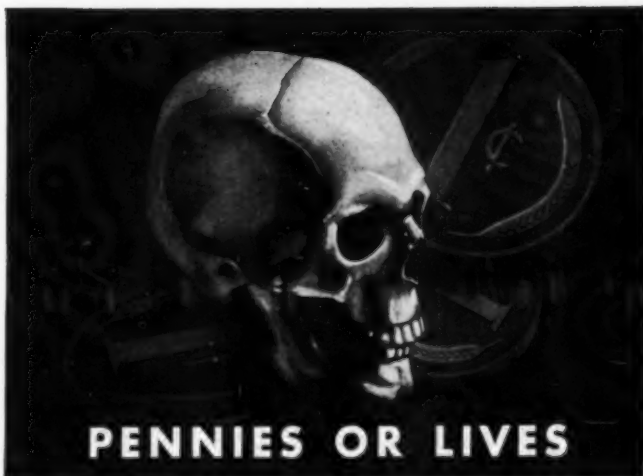
The Possibilities of Expansion of Railroad Electrification in the United States. This is the first report of the BCR Committee on Motor Power and the Joint Committee on Railroad Electrification, organized well over 2 yr ago to find ways of overcoming the obstacles to electrifying railroads. Equipment manufacturers, electric utilities, railroads and Battelle Memorial Institute joined the coal industry in the studies. Admitting that railroad electrification is not now an attractive investment and that engineering and construction would be expensive, the researchers studied feasible technical developments to reduce capital and operating costs (for instance, a 24-kv, 60-cycle system would entail 10% less capital expenditure and 40% less annual expense than the conventional 3,000-v DC system), other ideas that might be made feasible (for instance, high-frequency radio communications system and a new-type pantograph), and certain non-technical improvements (mostly in financing and underwriting). The general conclusion, based on these preliminary studies, is that further electrification can be made economically practicable. \$1, Edison Electric Institute, 420 Lexington Ave., New York 17; or Bituminous Coal Research, Inc., 2609 First National Bank Bldg., Pittsburgh 22.

### Testing Underground Stresses

Centrifugal Testing Apparatus for Mine-Structure Stress Analysis, by L. A. Panek. A new type of centrifugal testing apparatus developed at the Eastern Experiment Station, USBM, soon may provide an accurate method of designing safe and economical tunnels, slopes and mine rooms. Principle of the device is that centrifugal forces generated by rapid rotation of a test model produce strains equivalent to those created in a mine opening by pressures of surrounding formations. The apparatus may be used, for example, to determine the most efficient tension, length, spacing and orientation of roof bolts. USBM, R. I. 4883. 22 pp. 8 x 10 1/2 in.; paper; mimeo. Free, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.

### More About Controllers

Controllers for Electric Motors, by H. D. James and L. E. Markle, 2nd Edition. This revised edition retains and up-dates all information about the design, application, operation and maintenance of



## PENNIES OR LIVES



Behind many industrial accidents is the ghost of equipment failure, often caused by skimping on quality in favor of a few cents saved.



Such economies are always risky, always more costly in the end.



But when you use Laughlin Safety Hooks (and there are 15 sizes in eye, shank and swivel patterns) the extra pennies you spend will pay big dividends in protection of men and equipment.

The latch locks the load. It cannot open until released by the operator. And it's made of pressed steel or bronze with a stainless steel spring that won't rust or weaken. The cam is an integral part of the hook forging for extra strength.

The quality construction of Laughlin Safety Hooks is typical of all of Laughlin's 1500 types and sizes of drop forged wire rope and chain fittings. So remember—to save with safety always insist on the name LAUGHLIN for original equipment or replacement fittings.

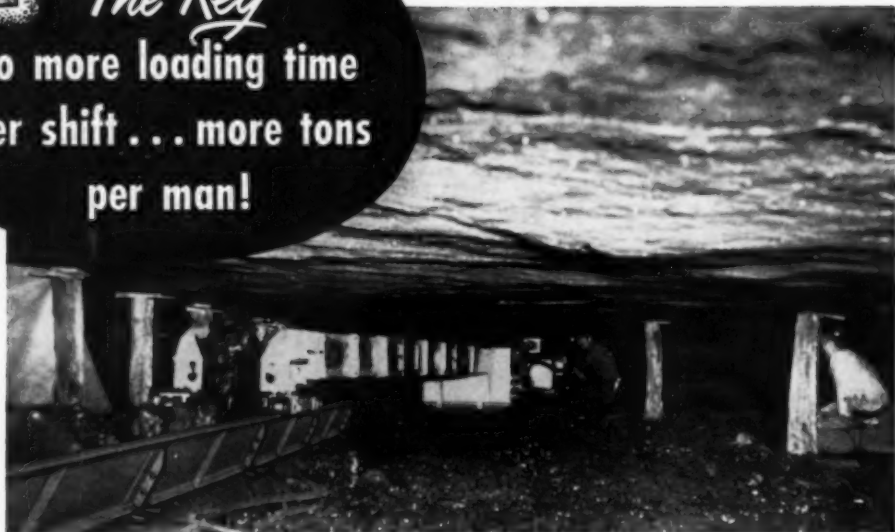
*Our Catalog No. 150 shows and describes the complete line. A free copy will be sent on request.*

THE THOMAS LAUGHLIN CO.   
97 FORE ST., PORTLAND, MAINE

# LAUGHLIN

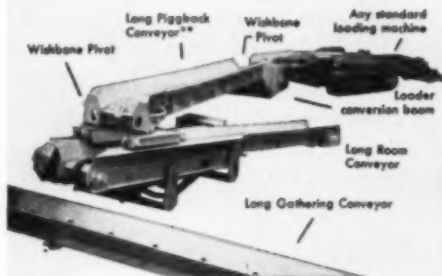
THE MOST COMPLETE LINE OF WIRE  
ROPE AND CHAIN FITTINGS

*The Key*  
to more loading time  
per shift... more tons  
per man!



## The Revolutionary LONG PIGGYBACK\* . . . the first and only bridge conveyor—assures increased production with any standard loader or continuous miner.

### Units of the LONG Piggyback System



The two "Wishbone" pivots—one at each end of the Piggyback—provide a pivot action of 180° each. This means the load is centered at all times and continuous haulage can be maintained at a 90° angle breakthrough and in close quarters. The dolly action permits long advances without pan-ups.

\*\*Patented and patents pending

In mine after mine, under a wide range of operating conditions, the Piggyback System has proved to be the most efficient, economical solution to the problem of true continuous mining.

Serving as a connecting bridge between the loader and room conveyor, the Piggyback takes coal out in a steady, continuous, controlled flow *as fast as it is produced*. Your loaders are kept busy, with no "down-time" waiting for intermittent transportation.

In operation, the loader-Piggyback-Long Room Conveyor combination works as a single unit. The receiving end of the Piggyback is attached directly to the loading machine and follows it automatically as it moves. That means the operator can devote his time exclusively to keeping the loader in coal. He never has to tram coal on the loader or stop for pan-ups.

In addition to its many other advantages, the Piggyback System is economical to install and offers substantial maintenance savings.

Long Piggyback Conveyors are available in two models with rated capacities from 2 to 5 tons per minute.

*Write for details or demonstration*

Long Super Mine Car Co., Inc. • Oak Hill, West Virginia



**LONG PIGGYBACK**  
CONTINUOUS HAULAGE MINING

\*Trade Mark

controllers in the first edition. Plus values, new with the revised volume, include developments such as the magnetic amplifier, the dynamo-electric amplifier, magnetic clutches, AC crane control and remote and supervisory control. There are descriptions of selsyn systems, microwave systems, pipeline controls, substation operations and telephone devices. 418 pp. \$7, McGraw-Hill Book Co., 330 West 42d St., New York 36, N. Y.

#### Other Books and Booklets

**Coal Sampling Problems**, by A. A. Orning. Contribution 177. 7 pp. 6 x 9 in; paper. Single copy, free; additional copies, 25c each, Coal Research Laboratory, Carnegie Institute of Technology, Pittsburgh, Pa.

**Analyses of Ohio Coals**. USBM, Bulletin 499. 50c, Supt. of Documents, Government Printing Office, Washington 25, D. C.

**The Coal Deposits of the Alkali Butte, the Big Sand Draw and the Beaver Creek Fields**, Fremont County, Wyoming, by R. M. Thompson and V. L. White. USGS, Circular 152. Free, Chief of Distribution, Geological Survey, Washington 25, D. C.

**Lignite Resources of South Dakota**, by D. M. Brown. USGS, Circular 159. Free, Chief of Distribution, Geological Survey, Washington 25, D. C.

**Pittsburgh Coal of the Federal Creek Field, Athens County, Ohio**, by G. E. Smith. R. I. 14. 13 pp plus map. 8 1/2 x 11-in; paper. Free, Div. of Geological Survey, Ohio State University, Columbus, Ohio.

**Carbonizing Properties: West Virginia Coals from the Pittsburgh Bed, Jamison No. 9 Mine, Marion County, and Upper Freeport Bed, Bull Run No. 1 Mine, Preston County**, by J. D. Davis, D. A. Reynolds, D. E. Wolfson, B. W. Naugle, R. E. Brewer and G. W. Birge. USBM, Bulletin 506. 35c, Supt. of Documents, Government Printing Office, Washington 25, D. C.

The following publications by the U. S. Bureau of Mines may be obtained free upon request to Publications Distribution Section, 4800 Forbes St., Pittsburgh 13. All are 8 x 10 1/2-in; paper; mimeo.

**Estimate of Known Recoverable Reserves of Coking Coal in Raleigh County, W. Va.**, by J. J. Dowd, A. L. Toenges, R. F. Abernathy and D. A. Reynolds. R. I. 4893.

**Preparation Characteristics of Coal from Clearfield County, Pa.**, by W. L. Crentz, A. L. Bailey and J. W. Miller. R. I. 4894.

**Successful Use of Wooden Roof Bolts in Stony Point Mine, Stony Point Coal Co., Hopkins County, Ky.**, by L. W. Kelly. USBM, I. C. 7637. 4 pp.

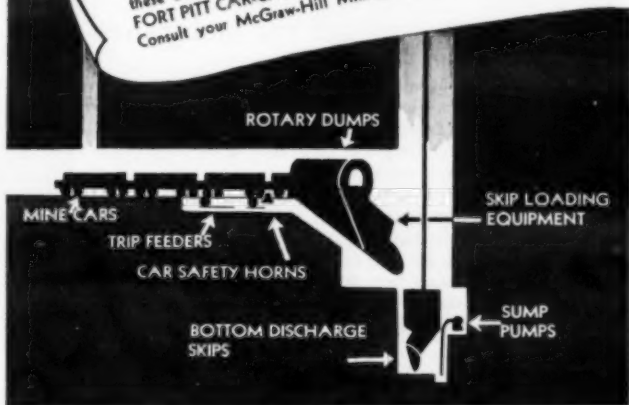
**List of Respiratory Protective Devices Approved by the Bureau of Mines**, by S. J. Pearce and L. B. Berger. USBM, I. C. 7636. 16 pp.



## LET CONNELLSVILLE HANDLE YOUR COAL From Mine Car to Railroad Car

For almost 50 years, Connellsville Equipment has been foremost in providing the most efficient, complete means of moving coal from the mine car to railroad car, both in the United States and foreign countries. Designed and sturdily-built for rugged, safe operation—Connellsville Equipment can do a maintenance-saving job for you. Why not write for details today!

In addition to the shaft equipment shown, we also manufacture haulages and belt conveyors for slope or drift mining, as well as these trade name products—LEPLEY HOISTING EQUIPMENT, FORT PITT CAR-CAGING EQUIPMENT and YOUGH PUMPS. Consult your McGraw-Hill Mining Catalogue.

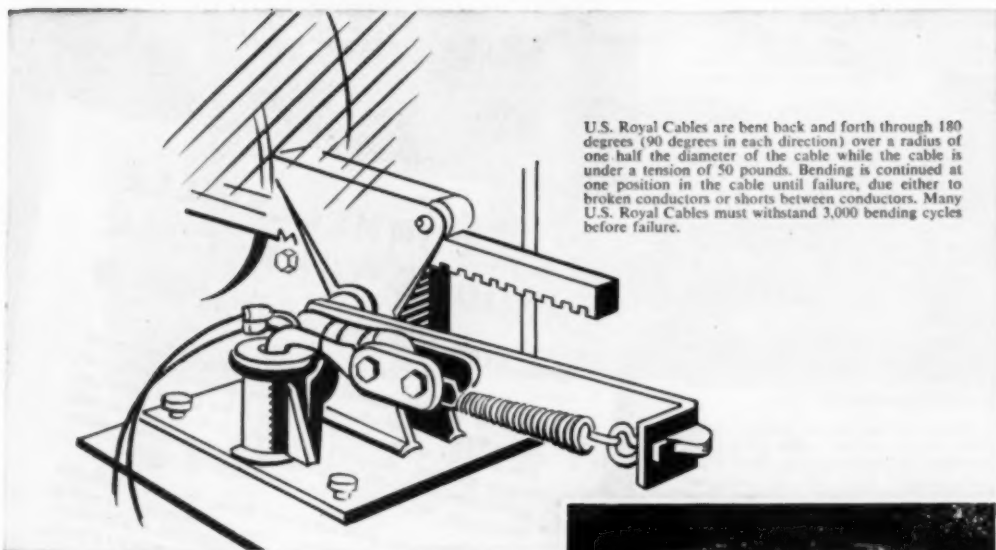


## CONNELLSVILLE MANUFACTURING & MINE SUPPLY CO.

CONNELLSVILLE, PA.

"SERVING THE MINING INDUSTRY SINCE 1901"

## What other portable cables can pass this test?

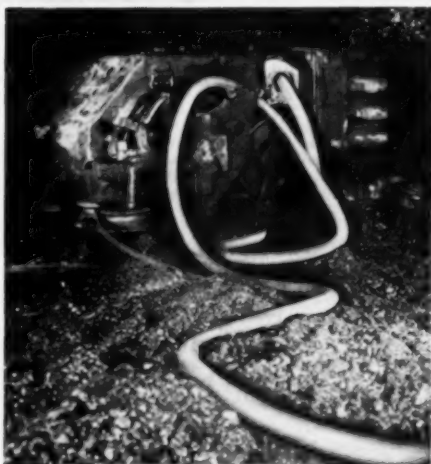


U.S. Royal Cables are bent back and forth through 180 degrees (90 degrees in each direction) over a radius of one half the diameter of the cable while the cable is under a tension of 50 pounds. Bending is continued at one position in the cable until failure, due either to broken conductors or shorts between conductors. Many U.S. Royal Cables must withstand 3,000 bending cycles before failure.

### U. S. Royal Trailing Cables are built for endurance

This is just one of half a dozen gruelling tests U.S. Royal Portable Cables must undergo. That's to make absolutely sure they have the full dependability required in today's mining operations. "U.S." builds these cables with the proper insulation and the tough jacket that are needed for long endurance.

United States Rubber Company is the only wire and cable producer to grow its own natural rubber, to make its own synthetic rubber and to manufacture its own plastics. "U.S." has been a pioneer in insulation for over 60 years, is backed by matchless experience and research data. Write to address below for free booklet, "U.S. Electrical Wires and Cables", which shows the complete line for the mining industry.



PRODUCT OF

**U.S. RUBBER**  
SERVING THROUGH SCIENCE

**UNITED STATES RUBBER COMPANY**

ELECTRICAL WIRE AND CABLE DEPARTMENT • ROCKEFELLER CENTER, NEW YORK 20, N. Y.



Men who depend  
on power...know  
they can depend  
on **CUMMINS®**



**Every CUMMINS DIESEL is built not once but twice**



**Leaders in lightweight, high-speed diesel power!**

Miners have learned to count on Cummins Diesels for dependable power day in, day out.

What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built *twice*. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care—together with Cummins' economy-proved fuel system and efficient parts and service organization—makes lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice for men who depend on power.

Whatever your power needs . . . whether it's for stripping or hauling, portable power units or generator sets—or any other important jobs . . . your Cummins dealer is the man to see.

**CUMMINS ENGINE COMPANY, INC.,** Columbus, Indiana

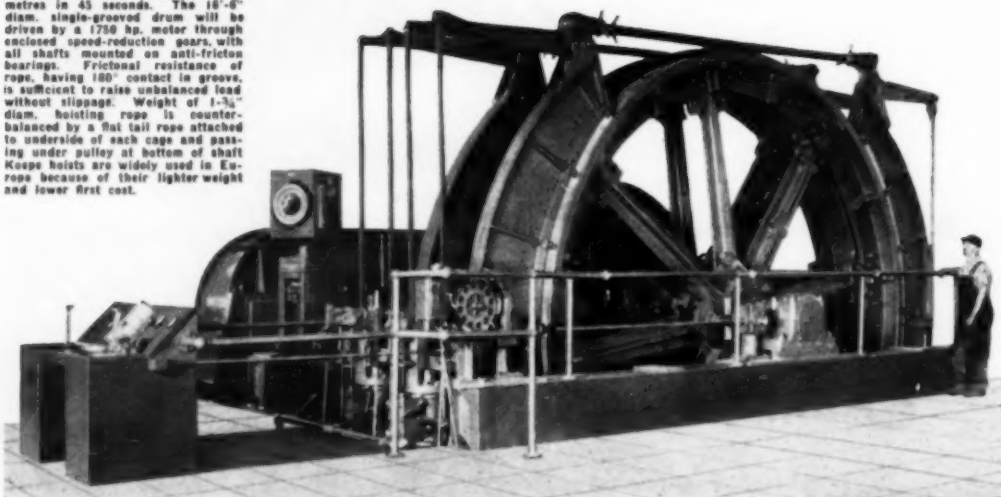
Export: Cummins Diesel Export Corporation  
Columbus, Indiana, U.S.A. • Cable: CUMDIE

(In U.S.)



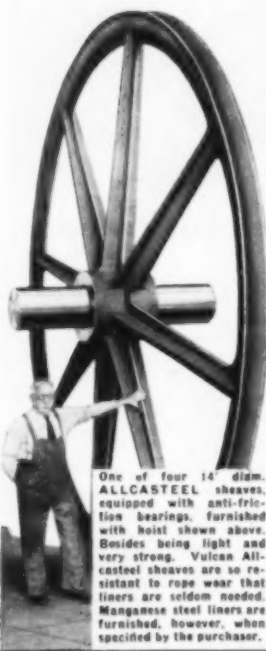
TRADEMARK REG. U. S. PAT. OFF.

"Keepe" hoist recently designed and built for high-speed balanced hoisting in a European coal mine. Unbalanced load of 12,500 lbs. must be raised a vertical distance of 800 metres in 45 seconds. The 10'-6" diam. single-grooved drum will be driven by a 1750 hp. motor through enclosed speed-reduction gears, with all shafts mounted on anti-friction bearings. Frictional resistance of rope, having 180° contact in groove, is sufficient to raise unbalanced load without slippage. Weight of 1-3/4" diam. hoisting rope is counter-balanced by a flat tail rope attached to underside of each cage and passing under pulley at bottom of shaft. Keepe hoists are widely used in Europe because of their lighter weight and lower first cost.



## HEAVY-DUTY HOISTING EQUIPMENT

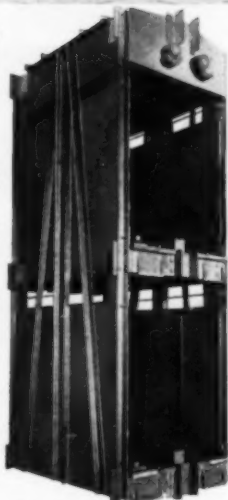
### Designed and Built To Meet ANY Specified Requirement



One of four 14 diam. ALLCASTEEL sheaves, equipped with anti-friction bearings, furnished with hoist shown above. Besides being light and very strong, Vulcan All-steel sheaves are so resistant to rope wear that liners are seldom needed. Manganese steel liners are furnished, however, when specified by the purchaser.

During more than a hundred years of continuous operation, the Vulcan Iron Works of Wilkes-Barre has designed and built so many different types of heavy-duty hoists that our engineers now meet practically any requirement with a background of experience along comparable lines that assures better results and quicker delivery than would otherwise be possible. Unusually complete manufacturing facilities, developed especially for this type of work, permit maintaining the highest possible standards of quality at competitive prices.

Correspondence is invited regarding any present or prospective requirement for modern hoists, sheaves, cages, skips, or other hoisting equipment. Illustrated bulletins, containing detailed information mailed promptly on request.



One of four double-deck cages furnished with hoist shown above. Each deck carries two mine cars. Heavy construction throughout, with extra-heavy thimbles, chains and safety devices, assures long service life with minimum maintenance expense.

## Vulcan Iron Works

ESTABLISHED 1849

Cable Address "Vulworks, Wilkes-Barre" **WILKES-BARRE, PA.** New York City Office, 30 Church Street

DESIGNERS AND BUILDERS OF ELECTRIC HOISTS, CAGES, SKIPS, SHEAVES, ETC., CONVEYORS, ROTARY KILNS, DRYERS, ETC., AND ALL TYPES OF MINING LOCOMOTIVES

SEE OUR FOUR-PAGE INSERT IN THE MCGRAW-HILL MINING CATALOGUES.



***Put 'em on a diet . . . with Pure Oil Industrial Lubricants***

In the complete line of high-quality industrial lubricants Pure Oil makes, you will find many oils and greases designed to do several *different* jobs, instead of one specific job.

And to do each job *equally well*.

This makes it possible for you to do *all* your lubricating with *fewer* lubricants. In other words, you can

***simplify and save . . . with***

***Pure Oil Industrial Lubricants***



**Be sure  
with Pure**

If you would like to keep your lubrication requirements from hogging your profits (and a penny saved is more than ever a penny earned, these days!) write: The Pure Oil Company, Industrial Sales, 35 E. Wacker Drive, Chicago 1, Illinois.

# Advance-Design CHEVROLET TRUCKS

These  
**PLAIN HARD FACTS**  
are important to  
economy-minded  
truck buyers



## Fact No. 1

### CHEVROLETS LIST FOR LESS

First cost—the list price—is less for a Chevrolet than for any comparable truck capable of handling the same payload. Chevrolet's position as the world's largest manufacturer of trucks makes possible production savings that are passed on to you.

## Fact No. 2

### COST LESS ON THE JOB

Proved Chevrolet truck features save money over thousands of miles. Time-tested Valve-in-Head engines, rugged hypoid rear axles, extra-sturdy channel-type frames, Flexi-Mounted cabs, Ball-Gear steering, Synchro-Mesh transmissions, all contribute to low operating costs with high dependability.

## Fact No. 3

### EACH TRUCK TAILORED TO ITS JOB

Every Chevrolet truck is factory-matched to the job it's going to do. Tires, axles, frame, springs, engine, transmission, and brakes are right for the operating conditions and load. Whatever your job is, there's a Chevrolet truck to fit it.

## Fact No. 4

### WORTH MORE AT TRADE-IN TIME

Chevrolet trucks traditionally bring more at resale than other makes costing about the same when new. Chevrolet trucks keep their value longer and give you real, substantial savings right up to the day you sell them. See your Chevrolet dealer soon.

## CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURATOR—for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHRO-MESH TRANSMISSION—for fast, smooth

shifting • HYPOID REAR AXLE—for dependability and long life • TORQUE-ACTION BRAKES—on light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES—on medium-duty models • TWIN-ACTION REAR BRAKES—on heavy-duty models • DUAL-SHOE PARKING BRAKE—for greater holding ability on heavy-

duty models • CAB SEAT—with double-deck springs for complete riding comfort • VENTILATION—far improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGNED BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN



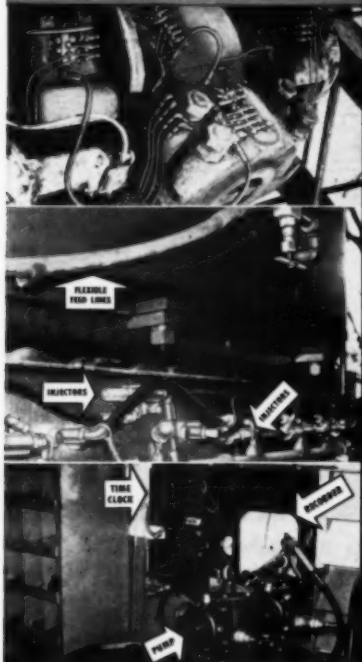
## **Lincoln** centralized lubrication systems

**save \$75,000  
per year  
maintenance cost  
on  
stripping  
equipment  
for Hanna  
coal company**

Div. of Pittsburgh Consolidated Coal Co.



Lincoln Centralized Lubrication Systems automatically lubricate over 200 bearing points on each of these 50 cubic yard Marion Shovels without shutting them down. The right Lubricant is supplied to each bearing in the right quantity, at the right time.



\*Trademark Registered.

... PIONEER BUILDERS

**LINCOLN**  
LUBRICATING EQUIPMENT...

The Lincoln Centro-Matic® System employed on the two Marion 50 cubic yard shovels at Hanna Coal Company's Georgetown No. 12 Property consists of an air-motor operated pump, electric time-clock controlled, with a 24 hour recorder, dispensing lubricant from an original 400 lb. refinery drum through a single supply line to Injectors, one for each bearing, connected by flexible or rigid tubing to the bearings. The System on each shovel automatically serves over 200 bearings while the machine is operating.

The supply of lubricant is tailored to the requirements of each bearing by adjusting the Injectors to deliver the exact quantity required. With the old system of hand lubrication, bearings were frequently damaged by over-lubricating them at the beginning of the shift and then starving them until the shovel was finally stopped for a new round. In addition to the hazards involved, a large quantity of lubricant was wasted.

- 1 All bearings on the dipper-stick swivel and knuckle assembly are lubricated simultaneously, through a circuit of 31 Injectors. Lubrication of these bearings by hand methods formerly required stopping the machine 15 minutes each shift while the oiler climbed the boom in all kinds of weather with a grease gun. This hazard has been eliminated, along with the 45 minutes production previously lost each day.
- 2 Centro-Matic® System automatically lubricates 98 circle-roller bearings in 4 to 5 minutes each 8 hour shift. Previously, the work was done by an oiler with a small hand grease gun while the machine was rotating, normally requiring 2 hours per 8 hour shift.
- 3 Duplicate pumps are provided as insurance against pressure failure. In addition to acting as a stand-by, one pump is also used to fill hand guns direct from the original refinery container to prevent contamination of lubricant.

For additional information on cost-reducing Lincoln Centro-Matic® Lubricating Systems for the Mining Industry, write for Bulletin 680.

**LINCOLN ENGINEERING COMPANY**

5729 Natural Bridge Ave., St. Louis 20, Mo.



# AMSCO MANGANESE STEEL WELDMENTS

## ADD NEW LIFE TO WORN EQUIPMENT



**Amsco Welding Rods and Electrodes**  
For repair welding of manganese steel shapes to worn equipment, American Manganese Steel Electrodes retain their toughness and give real operating savings.

Amscoating with Amsco Hard-

facing Rods increases service life ... reduces shutdowns.

Contact your Amsco Distributor or write for illustrated catalog WA-77 on Amsco Manganese Steel Weldments and Hardfacing Selector Guide.

**Brake Shoe**

**AMERICAN MANGANESE STEEL DIVISION**

409 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliet Steel Division, Joliet, Que. Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

# WANT A GOOD RULE



# To FOLLOW?\*

## Use

**WEST  
VIRGINIA  
CUSTOM-BILT**

- ARMATURE COILS
- STATOR COILS
- FIELD COILS
- REPLACEMENT PARTS

## WEST VIRGINIA ARMATURE COMPANY

BLUEFIELD • • • West Virginia • • • WILLIAMSON

\*Send us the coupon below and we will be glad to mail you free a six foot steel tape rule.

### BRANCHES

Mine Supplies, Inc., Montgomery, W. Va.  
Central Electric Repair Co., Fairmont, W. Va.  
Service Machine & Electric Co., Grundy, Virginia  
McDowell Armature & Machine Works, Welch, W. Va.  
Kentucky-West Virginia Armature Co., Whitesburg, Ky.  
American Armature & Engineering Co., Mullens, W. Va.

West Virginia Armature Company  
P. O. Box 437, Bluefield, W. Va.

Gentlemen: Please send me the six foot steel tape rule.

Name ..... Title .....

Company .....

Street .....

City ..... Zone ..... State .....



## YARDLEY PIPE and fittings ...the brand with *all* the features!

### **Lighter Weight**

200 feet of Yardley flexible M-1 in 2" size weighs only 87 lbs. compared to 730 lbs. for steel in the same size.

### **Faster Installation**

Saves time and labor. Long, flexible lengths uncoil quickly around curves and through crevices. Only needed tools are a screw driver and hand saw.

### **Longer Lasting**

Made of specially-compounded materials guaranteed not to rot, rust, corrode or scale. Absolutely unaffected by acid or alkaline water.

### **Less Friction**

Smoother walls and fewer fittings increase discharge more than 25% as proved by actual tests made by independent engineers.

### **Lower Cost**

Economy in installation, longer service life, greater efficiency, less power consumption make Yardley Pipe cost less in the long run.

### **Complete Line**

Yardley makes both flexible and rigid pipe in a full range of sizes, for corrosive drainage, fresh water, suction or high pressure use. Know the reputation and facilities of your source of supply.

SEND FOR LITERATURE



**YARDLEY PLASTICS CO.**  
142 PARSONS AVE., COLUMBUS 15, OHIO



## Makes lighter Work of **Granular Coal Sludges**

To handle heavy granular solids subject to widely fluctuating feeds — note the 4-arm feature of the Dorr Torq Thickener.

Two long arms rake the outer section of the tank floor. The two short arms handle the load in the inner section, raking all the solids to a conventional center-cone discharge. All four arms

are provided with the exclusive Torq feature . . . which reduces overload by continuous raking action . . . eliminates the danger of stalling and damaging the unit.

For more information about the mechanical advantages of the 4-Arm Torq and the complete Dorr Thickener line, ask us to send you a copy of Bulletin No. 3001. THE DORR COMPANY, Barry Place, Stamford, Conn.

*Torq is a registered trademark of The Dorr Company.*



Better tools **TODAY** to meet tomorrow's demand

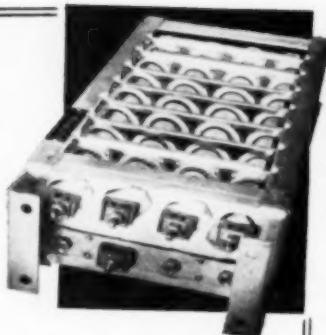
# DORR

WORLD - WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.  
Offices, Associated Companies or Representatives in principal cities of the world.



# GUYAN RESISTORS for LOADERS



GUYAN Loader Resistors are built into a light but sturdy frame-work—have same ohmic resistances as specified by the loader manufacturer and have ample current capacity to prevent burn-outs. Designed to fit original mountings.

All terminals are easily accessible, plainly marked and conform with original wiring diagram.

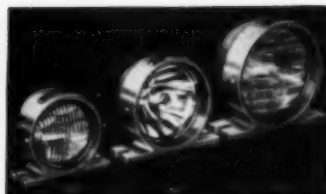


For a complete range of quality, long life resistance products investigate the GUYAN line. Write today.



**GUYAN  
MACHINERY  
COMPANY**

LOGAN, W. VA.



## GUYAN Sealed Beam HEADLIGHTS for MINE EQUIPMENT

GUYAN Sealed Beam Headlights are made in three sizes to meet various mining conditions. The voltage rating is 6 volts for all three types. To operate from 250 or 300 volt trolley voltage we can furnish either a resistor or a power unit.

Type 4 IN is recommended for gathering locomotives, shuttle cars and loading machines.

Type ML for main line locomotives has a narrow, powerful beam (70,000 beam C.P.)

Type 7 IN is a utility headlight using standard automobile lamp, two filaments, to project the beam either close or far.

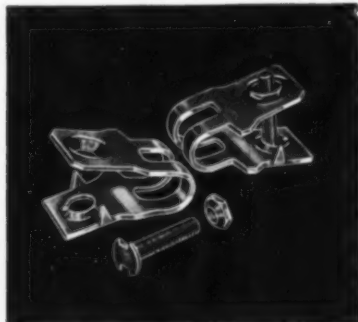
Write for Bulletin

**GUYAN  
MACHINERY CO.**  
LOGAN . . . West Virginia

# HINGED PLATEGRIP BELT FASTENER No. 500

for  
Conveyor Belts

Specially designed to permit quick and easy method of adding to, or reducing length of belt. Just pull the hinge pin to open joint.



Write for Catalog Sheets. PLATEGRIP for dust-tight permanent joints. HINGED PLATEGRIP for "add-on" belts. REPAIR PLATES for patching worn or repairing torn belts.

**ARMSTRONG-BRAY & CO.**  
5340 Northwest Highway  
Chicago 30, Illinois



# INDUSTRIAL TRACK



Need Rails—Switches—Frogs—Guard Rails—Track Tools? For best selections, prompt deliveries—try FOSTER—shipments from stock in 5 nationwide warehouses.

Call on FOSTER for everything in Industrial Track Equipment and supplies.

**RAILS New and Relaying**

Send for Track Equipment Catalog #C9

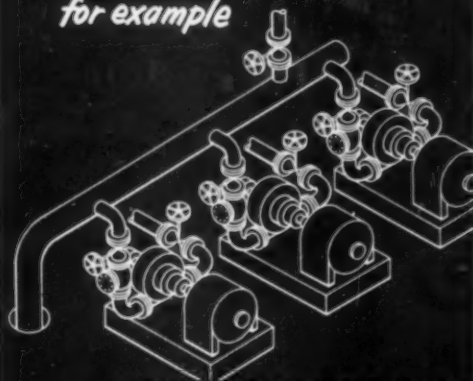
**LE FOSTER co.**

STEEL SHEET PILING • PIPE • WIRE ROPE  
PITTSBURGH 30, PA. NEW YORK 7, N.Y.  
CHICAGO 4, ILL. HOUSTON 2, TEX.



# Can You Trust Your Checks to Hold Like This?

...on Water Pumps,  
for example



THE INSTALLATION

Crane Iron Body Swing Check Valves in 8-inch vertical lines on discharge side of water pumps supplying a large eastern paper mill.

## THE HISTORY

The mill depends on these pumps for all water. Loss of head at the pumps would create a serious problem. The mill could take no such risks. Regularly, the check valves on pumps were replaced, but only to be found leaking between pumping cycles, a few months later.

It's now more than a year since the change-over was made to Crane Check Valves. There's been no loss of water, no maintenance or replacement of any checks on the pumps. That was proof enough for the mill, that Crane Quality means better valves—greater dependability and bigger value. As a result, 3 more of these checks were installed on a separate battery of suction pumps.

## VALVE SERVICE RATINGS

### SUITABILITY:

*Working smoothly—no complaints*

### FEATURES:

*O.K. for either horizontal or upward flow*

### MAINTENANCE COST:

*None—no maintenance needed to date*

### SERVICE LIFE:

*Now better than other checks used*

### OPERATING RESULTS:

*No water or head loss*

### PRICE:

*In line with other makes*

### AVAILABILITY:

*Stock item—Crane product*

## THE VALVE

Crane No. 373, 125-Pound Iron Body Swing Check Valves, brass trimmed. The long life and high seating efficiency of these checks, in 2 to 8-in. sizes, is in large part due to the Crane patented flexible disc-hinge design. Double spring mounting eliminates lost motion between parts, yet permits true, full contact of disc and seat at every closure. Also serves to absorb the shock of seating under back-flow pressure. See your Crane Catalog or Crane Representative for full details.



The Complete Crane Line Meets All Valve Needs. That's Why

More Crane Valves Are Used Than Any Other Make!

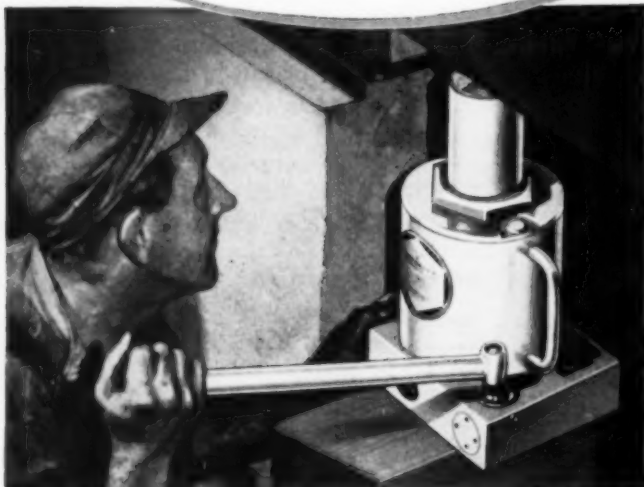
# CRANE VALVES

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois  
Branches and Wholesalers Serving All Industrial Areas

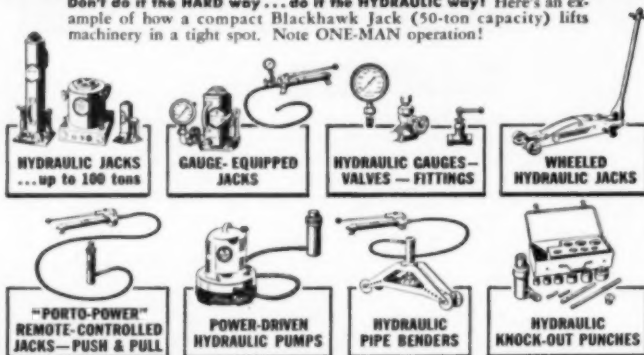
VALVES • FITTINGS • PIPE • PLUMBING • HEATING

# Pick the right jack for the job

...from the world's most complete  
line of hydraulic equipment



Don't do it the **HARD** way... do it the **HYDRAULIC** way! Here's an example of how a compact Blackhawk Jack (50-ton capacity) lifts machinery in a tight spot. Note **ONE-MAN** operation!



YOU GET ALL THESE HYDRAULIC TOOLS ONLY FROM BLACKHAWK

## BLACKHAWK

Save buying time when you need hydraulic equipment. Specify Blackhawk—and be sure you'll get the hydraulic tool that will match your requirements exactly.

Order from leading supply houses. Write for free catalogs. Products of Blackhawk Mfg. Co. Dept. J-4592, Milwaukee 1, Wisconsin.

### PROFESSIONAL SERVICES

Consulting • Plant Design  
Research • Inspection  
Land Examinations  
Testing • Appraisals

### ALFORD, MORROW & ASSOCIATES

Consulting Engineers  
Coal Mining and Preparation  
Property Valuations  
Prospecting, Development, Mapping  
1632 Oliver Building Pittsburgh 22, Pa.

### ALLEN & GARCIA COMPANY

40 Years' Service to the  
Coal and Salt Industries and Consultants  
Constructing Engineers and Managers  
Authoritative Reports and Appraisals  
232 S. Michigan Ave., Chicago  
129 Wall Street, New York City  
London W.1

### GEO. S. BATON & COMPANY

Consulting Engineers  
Cost Analysis — Valuations  
Mine and Preparation Plant Designs  
1100 Union Trust Building Pittsburgh 19, Pa.

### F. CARL COLCORD CONSULTING ENGINEER

COAL LAND VALUATIONS  
MINE INSTALLATIONS  
OPERATION  
Box 268, Paris, Ky. Phone 327W

### EAVENSON & AUCHMUTY

MINING ENGINEERS  
COAL OPERATION CONSULTANTS  
VALUATION  
2720 Koppers Bldg. Pittsburgh 10, Pa.

### HENRY O. ERB

COAL PREPARATION CONSULTANT  
PLANT DESIGN & OPERATION  
Midwestern Representative  
VIKING HOT VAPOR  
OIL TREATING PROCESS  
619 So. 4th St. — Terre Haute, Ind.

### FERGUSON-GATES ENGINEERING CO.

Registered Civil and Mining Engineers  
Reports on Developed and Underdeveloped Coal  
Properties  
Valuations and Appraisals  
Studies of Airborne Dust and Dust Control in the  
Mines  
Consultation Service  
Allen Building P. O. Box 672  
Telephone 5721 Beckley, W. Va.

**YOUR** card here builds prestige  
for you and helps to make your  
name familiar in the field. The cost  
is extremely small in proportion to  
its value as a business aid.

## PROFESSIONAL SERVICES

Consulting • Plant Design  
Research • Inspection  
Land Examinations  
Testing • Appraisals

### J. H. Fletcher

36 years  
Continuous Consulting Service  
to Coal Mines

Telephone Harrison 7-5151  
232 S. Michigan Ave. Chicago 4, Illinois

### HERBERT S. LITTLEWOOD

CONSULTING ENGINEER

Application — Supervision of Installation  
Maintenance — Inspection — Testing  
POWER HAULAGE HOISTING  
VENTILATION  
Irwin, R. D. #3, Pa.

### SEBA M. PARMLEY

Consulting Engineers

Coal Preparation  
Investigation—Plant Layout and Design  
Water Clarification—Plant Control  
210 Castle Shannon Bldg. Pittsburgh 28, Pa.

### DAVIS READ

CONSULTING ENGINEER

Layout — Operation  
Modern Production Methods  
Plant Design — Preparation  
120 S. LaSalle St. Chicago 3, Ill. 225 E. Noel Ave. Madisonville, Ky.

### TEMPLETON-MATTHEWS CORPORATION

Designing Engineers—Consultants—Builders  
MODERN COAL PREPARATION PLANTS THRU  
"CO-OPERATIVE ENGINEERING"  
806-68 Sycamore Bldg. Terre Haute, Indiana

### PAUL WEIR COMPANY

Mining Engineers and Geologists  
Consultants and Managers

20 North Wacker Drive  
Chicago 6, Illinois

### J. W. WOOMER & ASSOCIATES

Consulting Mining Engineers

Modern Mining Systems and Designs  
Foreign and Domestic Mining Reports  
National Bank Building Wheeling, W. Va.  
Union Trust Building Pittsburgh, Penna.

### READERS MAY CONTACT THE CONSULTANTS

with the confidence justified by the offering  
of these special services nationally.  
Whose Cards Appear on This Page

Collyer Twin Parallel Type G  
... easy to strip, easy to terminate,  
dependable mining cable  
at its best.

PUT POWER  
TO WORK...

WITH

*Collyer*  
MINING CABLES

Whatever your cable requirements,  
Collyer will be glad to quote.

Send specifications to  
Collyer Insulated Wire Co.,

245 Roosevelt Avenue,  
Pawtucket, Rhode Island.

why "L-B"

Cast Buckets give you  
longer life, cleaner handling



NEXT time you replace the buckets on your elevators, check into the money-saving advantages of Link-Belt Cast Buckets. You'll find their accurate balance and advanced design pay off in proper filling, clean discharge.

For a long, durable life — they're made of top-grade malleable iron or Promal (the stronger, longer-wearing metal) to resist abrasion, corrosion and hard usage. Smooth, seamless surface minimizes friction and wear. Corners are reinforced to give added strength.

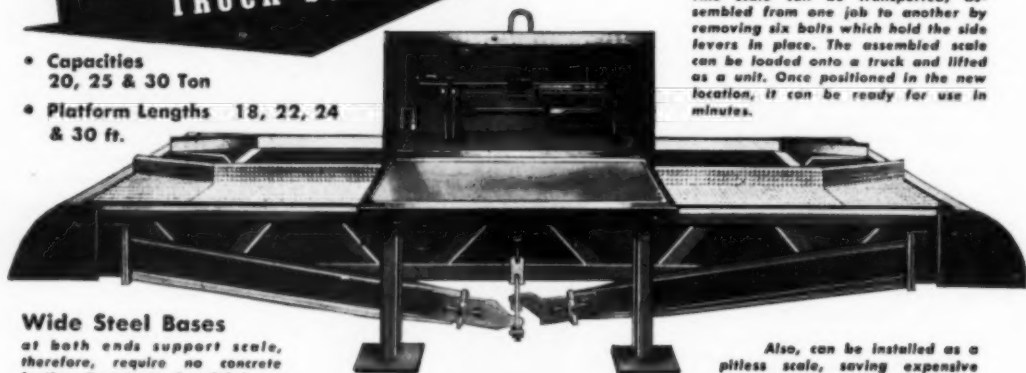
Link-Belt builds all sizes in six different styles . . . for either chain or belt mounting. Complete L-B line also includes steel buckets of various designs. Contact your nearest Link-Belt office for complete information.

**LINK-BELT**  
CAST ELEVATOR BUCKETS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in principal cities. 10,517

**THURMAN PORTABLE  
TRUCK SCALE**

- Capacities  
20, 25 & 30 Ton
- Platform Lengths 18, 22, 24  
& 30 ft.



**Wide Steel Bases**

at both ends support scale, therefore, require no concrete footing. Easy-to-read weigh-beam is chrome-plated. Other vital parts electro-plated against erosion.

**THIS SCALE CAN BE MOVED  
FROM JOB TO JOB, AS A UNIT**

**Accurate and Portable**

This scale can be transported, assembled from one job to another by removing six bolts which hold the side levers in place. The assembled scale can be loaded onto a truck and lifted as a unit. Once positioned in the new location, it can be ready for use in minutes.

Also, can be installed as a pitless scale, saving expensive concrete pit-construction costs.

**The Thurman Line Includes:**

- Pit Scales up to 30-Ton capacity
- Pitless Scales • Butchering Scales • Liquid Weighing Scales
- Wheelbarrow Scales • Warehouse Scales • This and other weighing equipment in sizes to fit your requirements

**THURMAN MACHINE CO.**  
(Scale Division)  
Established 1918

N. 5th Street, Corner of Lafayette, Columbus 15, Ohio

# Lighter... TOUGHER

## COFFING CHALLENGER SPUR-GEAR HOIST

Never before such easy portability and rugged, shock-resisting strength in a spur-gear hoist... never such simplicity of design and ease of servicing.

**Light weight**—carry it in one hand; set it up anywhere. One-ton model weighs only 39½ lbs.

**All Steel**—even the housing. Takes shock loads and impact as only steel can.

**Easy to Service**—may be completely disassembled in minutes with ordinary tools. Simplest spur-gear hoist ever built.

Find out how this better spur-gear hoist can improve operations and save expense for you. Write for bulletin G9C.



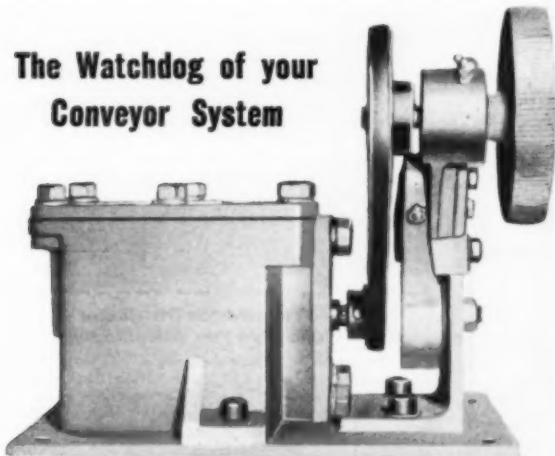
½-, 1- and 2-ton capacities. Tested at 100 percent overload.

**COFFING  
HOIST  
COMPANY**  
DANVILLE, ILLINOIS

Quik-Lift Electric Hoists • Hoist-Alls Safety-Pull Ratchet Lever Hoists • Mighty-Midget Pullers Differential Chain Hoists Load Binders • I-Beam Trolleys

Sold By Distributors Everywhere.

## The Watchdog of your Conveyor System



BULLETIN 1101 CENTRIFUGAL SWITCH—with Explosion Tested Enclosure

ENSIGN Bulletin 1101 Centrifugal switch for Belt Conveyors provides belt protection and sequence operation of multiple conveyors, including shaker or Chain Conveyors feeding onto Belt Conveyor. Bulletin 1100 with Dust Tight Enclosure.

# ENSIGN

ELECTRIC AND

MANUFACTURING CO.

910 Adams Ave.



Huntington 4, W. Va.

## BITUMINOUS

*Security with Service*

**BENEFITS  
THE  
MINING INDUSTRY**



OPERATOR



WORKER

The Bituminous slogan, "Security with Service," applies to all phases of mining operation... to operators and workers alike. It keynotes the Bituminous Safety Engineering program, consisting of regular mine inspections... analysis of mine hazards... survey recommendations... accident prevention activities... reduction of operating expenses resulting from accidents... and establishment of production efficiency. Bituminous Safety Engineers are constantly alert to the hazards that might affect Bituminous Workmen's Compensation policyholders... and to forestall these hazards before they take shape. Thanks to their training and skill, Bituminous' slogan is a "living" phrase, packed with meaning for the mining industry.

**BITUMINOUS CASUALTY  
CORPORATION**



ROCK ISLAND, ILLINOIS

**OVER 30 YEARS OF SERVICE  
TO THE MINING INDUSTRY**



Wherever  
You Find *Safety First* . . .

# SLIPKNOT

*Mine*

## FRICITION TAPE

*...is first choice in the  
field of mining...because...*

- It has outstanding adhesive qualities under all conditions
- It's guaranteed not to dry out
- It will not ravel at the edges
- It exceeds all specifications



SLIPKNOT MINE FRICITION TAPE is the result of more than fifty years of manufacturing integrity. For years it has been the most widely used tape in the mining field.

By the makers of Plymouth Plastic  
Electrical Tape and  
PR Splicing Compound

**PLYMOUTH RUBBER COMPANY, INC.**

*Manufacturers of Slipknot,  
the World's Largest Selling Friction Tape  
Canton, Mass.*



## You can't beat 'em for bits!

### Norton K-Bond CRYSTOLON\* Wheels Grind Fast...Run Cool...Last Long

Here's the ideal grinding combination to keep your carbide-tipped drill and cutting machine bits in condition to deliver steady top tonnage.

Norton green CRYSTOLON abrasive is a special silicon carbide, with properties that assure fast, free, cool cutting — and maximum wheel life — on all carbide grinding jobs. And the new vitrified K-Bond is so closely controlled that you can get wheels of half-grade increments of hardness. This lets you "pin-point" specifications to your individual needs.

Be sure to investigate all the time- and money-saving advantages of green CRYSTOLON wheels for your carbide bit grinding.

#### Your Norton Distributor Can Give You Valuable Help

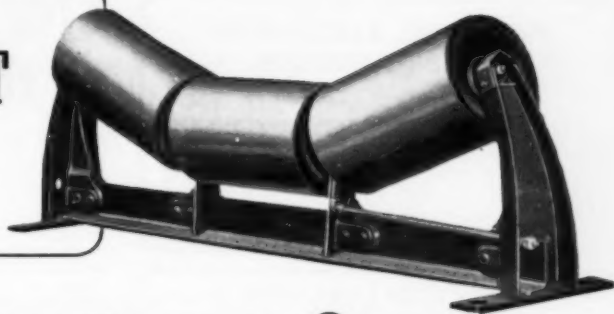
Besides his own practical experience with abrasive applications in the coal mining field, your Norton Distributor can call in Norton Abrasive Engineers for additional expert aid in solving your grinding problems. Take advantage of the wide store of helpful knowledge he makes available to you. See him for the right wheels to use in any grinding job. NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities. Export: Norton, Behr-Manning Overseas Incorporated, Worcester 6, Massachusetts.

\*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries.

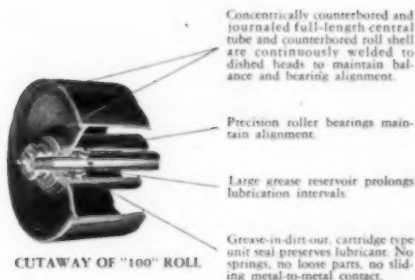
**NORTON**  
ABRASIVES

*Making better products to make other products better*

# LINK-BELT IDLERS



## ...cut your handling costs 3 ways



YES, you save money three ways when you specify Link-Belt Roller Bearing Idlers—

- (1) Reduced maintenance, thanks to better lubricant retention and longer-lasting adjustment.
- (2) Less "down-time," thanks to husky, self-aligning roller bearings and efficient sealing.
- (3) Lower power requirements, thanks to smooth anti-friction action.

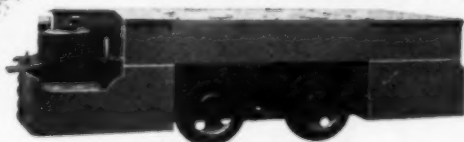
And by standardizing its design, Link-Belt gives you the famous chip-handling 45° Idler at a cost lower than you'd expect. You can choose from the full Link-Belt line of standard and heavy-duty 20° troughing, impact-cushioning, belt training and flat belt idlers in a wide range of roll diameters and belt widths.

**LINK-BELT**  
ROLLER BEARING IDLERS

**LINK-BELT COMPANY**  
Chicago 9, Philadelphia 40,  
Pittsburgh 13, Wilkes-Barre,  
Huntington 9, W. Va., Louis-  
ville 2, Denver 2, Kansas City  
8, Mo., Cleveland 15, Indian-  
apolis 6, Detroit 4, Birmingham  
3, St. Louis 1, Seattle 4, Toron-  
to 8, Springs (South Africa).

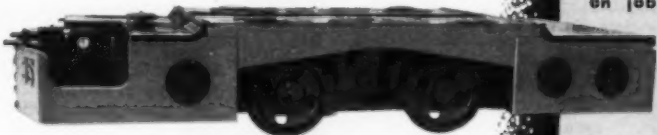
12,540

## NOW—real low type Storage Battery Locomotives



**Low type RANGER**

Height—25" to 33" depending on battery capacity required.  
Weight—3T to 5T. Track Gauge—18" to 56½".



**Low type MONITOR**

Height—26" to 33" depending on battery capacity required.  
Weight—6T to 10T. Track Gauge—18" to 56½".

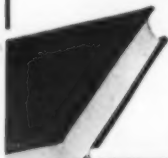
All Greensburg Storage Battery Locomotives are custom built to your individual requirements in single or double motor drives with drum or contactor type controllers. Because of their modern engineered design, our locomotives have, time after time—on job after job, proven themselves more efficient... given longer battery life and outperformed all other storage battery locomotives of equal weight and battery capacity.

**GREENSBURG MACHINE CO.**

102 STANTON ST., GREENSBURG, PA.

## NATIONAL ELECTRICAL CODE HANDBOOK

7th Edition



New Seventh Edition completely revised to conform with the 1961 National Electrical Code requirements. It explains the rules and measurements for the various types of jobs—what they mean—how to apply them. All the rules for a job are in one place. Includes everything from special requirements pertaining to hazardous locations to complete tables giving the full load current, wire size, conduit size and branch from rating of various types of motors. By Arthur L. Abbott. 7th Ed., 652 pp., 441 illus., \$6.00.

## CONTROLLERS FOR ELECTRIC MOTORS

Second Edition

Explains selection, operation, maintenance, and inspection of modern control apparatus. Describes commercial controllers—shows best methods for motor acceleration, speed control, braking, regeneration. Covers protective devices, magnetic amplifiers, magnetic clutches, eddy-current brake, crane control, d-c control, etc. Helpful facts on remote and supervisory control are included. By Henry Russell James, Consulting Eng., and Lewis Edwin Marks, Design Eng., Westinghouse. 2nd Ed. 410 pp., 312 illus., \$7.00.



## ENERGY SOURCES

The Wealth of the World

A thorough census of our energy sources—past, present, and future. Reviews the size of fuel supplies, technology of production efficiency, conversion, and progress in conservation. Shows how man has used energy in the past and what use he may expect in the future. Everything from fossil fuels and hydroelectric power generation to nuclear and solar energy is discussed. By Eugene Ayres, Gulf Research & Development Co., and Charles A. Scarlott, Editor, Westinghouse Engineer. 344 pp., 114 illus., \$5.00.



## MECHANICAL ENGINEERS' HANDBOOK

5th Edition

Fifth Edition of Marks' Handbook gives 10 completely revised and modernized sections covering every phase of mechanical engineering—from aerodynamics to mechanical refrigeration—from metal cutting machines to hoisting and conveying. Brings you many advances in theory, processes, materials and power—a reference on both routine and complicated problems. By Lionel S. Marks, Prof. of Mech. Engr., Emeritus, Harvard Univ. 5th Ed., 2236 pages, approx. 2000 illus., \$15.00. Available on easy terms; see coupon.



### SEE THESE BOOKS 10 DAYS FREE

McGraw-Hill Book Co., 330 W. 42nd St., New York 36. Send me book(s) checked below for 10 days' examination on approval. In 10 days I will remit for book(s) I keep, plus few cents for delivery; and return unwanted book(s) postpaid. (We pay for delivery if you remit with this coupon; same return privilege).

☐ Abbott: Nat'l. Elec. Code Hndbk. 7th Ed.—\$6.00

☐ Ayres & Scarlott: Energy Sources—\$5.00

☐ James & Marks: Cont. for Elec. Motors. 2nd Ed.—\$7.00

☐ Marks: Mech. Eng. Hndbk. 5th Ed.—\$15.00 (payable \$3.00 in 10 days and \$3.00 monthly)

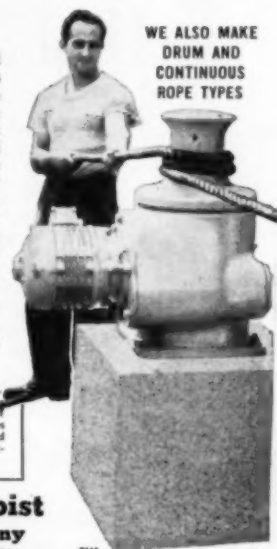
Name .....  
Address .....  
City ..... Zone ..... State .....  
Company .....  
Position ..... C-9-52

This offer applies to U. S. only.

## STOP WASTING MONEY on stalled freight cars!

How much time and money have you lost this year, waiting for switch engines? Demurrage costs can really mount up fast. But you can pull them down fast with AMERICAN Electric Car Pullers. No waiting for a switcher. No "stand-by" charges. One man can move one or more rail cars at 40 to 45 feet per minute. Tackle many other jobs, too, with an AMERICAN Car Puller—bending steel, dragging loads, warping barges.

WE ALSO MAKE  
DRUM AND  
CONTINUOUS  
ROPE TYPES



WRITE FOR FREE BOOKLET  
showing full line. Contains tables  
to help you figure line pull needed  
for your types of cars, with curva-  
ture and grade factors.

**American Hoist  
& Derrick Company**  
SAINT PAUL 1, MINNESOTA

## FASTER — EASIER Corrosion Proof Piping with PLASTEX



The extreme lightweight and flexibility of PLASTEX pipe makes it ideal for use in irregular mine passages. Coils up to 400 ft. can be put in operation in a few minutes without special tools or handling equipment. PLASTEX far outlasts ordinary pipe because it is guaranteed against rust, rot and electrolytic corrosion. The smooth surface stays clean and free from scale assuring greater flow and trouble-free performance. Ask your supplier for PLASTEX mine pipe—or write for specifications.

The PLASTEX Pipe & Extrusion Co.  
402 Mt. Vernon Ave., Columbus 3, Ohio



PLASTEX PIPE  
CORROSION PROOF



# This Door has saved countless lives . . . increased production by millions of tons . . .

Engineered flow of air sweeps out gas pockets, and air flow must be continuous, reliably directed by "Canton" Automatic Doors. Dissipating explosive air is one important function. Providing healthy, breathable air is another function that steps up productivity of every worker. Eliminating that trapper boy accident is another.

Insurance against accidents, increased haulage, continued speed ahead with "Canton" Automatic Doors make it imperative that every mine owner and manager investigate the economy proven by a quarter century of American Mine Door service.

## "CANTON" DOORS ARE SELF LIQUIDATING IN A SHORT PERIOD

Note the photos . . . when the oncoming train rides the trip levers . . . flip, the doors open; when the last car passes . . . release, the doors spring shut . . . positive action and reaction . . . all mechanical in split seconds. Complete literature sent on request, engineering advice given without obligation. When writing, please use street and zone number.



See Us at the Denver Show - Booths 1217 to 1221

**American Mine Door Company**

2057 Dueber Avenue  
Canton 6, Ohio

Manufacturers of "Distributors"—Automatic Switch Throwers—Automatic Mine Doors—Mechanical Track Cleaners

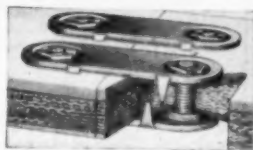
# FLEXCO

## BELT FASTENERS and RIP PLATES



FOR HEAVY  
CONVEYOR  
AND  
ELEVATOR  
BELTS OF  
ANY WIDTH

- ★ FLEXCO Fasteners make tight butt joints of great strength and durability.
- ★ Trough naturally, operate smoothly through take-up pulleys.
- ★ Distribute pull or tension uniformly.
- ★ Made of Steel, Monel, Stainless, Everdur.
- ★ Also Promal top plates.
- ★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-100

**FLEXIBLE STEEL LACING CO.**

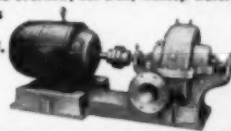
4638 Lexington St., Chicago 44, Ill.

## Faithful Performance on Important Jobs

— such as water supply, brine circulation, booster service, white water and overflow, hot well, makeup water, etc., etc.

Capacities  
to  
1,200 G.P.M.

Heads  
to  
460 Ft.



PUMPS  
by  
Aurora

TYPE-AD Aurora Horizontally Split Case, Back-to-Back Impellers, Two Stage Centrifugal Pump.

Particularly suited to clear water and low viscosity liquids not containing solids.

Write for BULLETIN 106

For Every Purpose

APCO TURBINE-TYPE PUMPS are unbeatable on low capacity, high head duties.

Capacities  
to 150 G.P.M.  
Heads  
to 500 Ft.

AURORA CENTRIFUGAL PUMPS

are available in many types and sizes—all noted for their streamline coordination between impellers and shells.

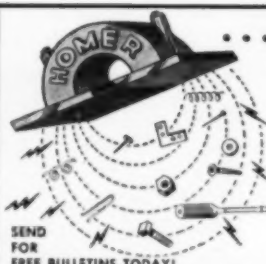
Write for CONDENSED CATALOG "M"



DISTRIBUTORS IN PRINCIPAL CITIES

**AURORA**  
PUMP COMPANY

92 Loucks Street, Aurora, Illinois



SEND  
FOR  
FREE BULLETINS TODAY!

## ... Here is GUARANTEED MAGNETIC PROTECTION for INDUSTRIAL and PROCESSING USES!

**MAGNETIC PLATES**—Std. widths 4" to 36"; Lengths and number of poles as required. Specials on order.

**MAGNETIC DRUMS**—Std. diameters 12" to 30"; Face widths 4" to 60", with or without enclosures.

**MAGNETIC HAND AND ROAD SWEEPERS**—Available in Standard, Heavy-duty or Hi-Intensity Models. Sweep widths 12", 18", 24", 36", 48", 60" and 72".

**MAGNETIC PULLEYS**—Std. diameters 12" to 30"; Belt widths from 4" to 60". Larger sizes on order.

**MAGNETIC PIPE DUCTS**—Available in line sizes from 4" up to 12", for either air or gravity systems.

**MAGNETIC PULLEY UNITS**—Pulley sizes from 12" to 30" dia., belt widths 4" to 60". Length of unit as desired.

**MAGNETIC LIQUID TRAPS**—Line sizes to 4" for Sanitary or Industrial uses. Standard or heavy-duty models.

**THE HOMER MANUFACTURING CO. Inc., Dept. 59, LIMA, OHIO**

## Core Drilling *by Contract*

Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures.

Core Drill Contractors for more than 60 years

**JOY MANUFACTURING CO.**  
Contract Core Drill Division  
MICHIGAN CITY, INDIANA

If there is

**something you want . . .**

that other readers of this paper can supply

OR —

**something you don't want . . .**

that other readers can use, advertise it in the

### SEARCHLIGHT SECTION

(Classified Columns)  
of this paper

## "Sutton" SAND DRYING STOVES

The Standard for Over Forty Years

**Burns Any Type of Fuel**

The "Sutton" Sand Dryer may be fired with any type of fuel. While most "Sutton" Sand Dryers are equipped to burn coal, they can be furnished with burners for natural gas or fuel oil.



### "SUTTON" FEATURES

- Simple in operation
- No skilled labor necessary
- Made in four sizes
- Lowest original cost
- Economical upkeep
- Topmost efficiency

**SATISFACTION GUARANTEED**

Catalog and Prices sent upon request

**INDIANA FOUNDRY COMPANY**  
950 Oak Street Indiana, Pa.

## HOFFMAN BROS. DRILLING CO.

*Diamond Core  
Drilling Contractors*

PUNXSUTAWNEY  
PENNSYLVANIA

Tel. 382



WE HAVE SPECIALIZED IN  
TESTING BITUMINOUS COAL  
LANDS FOR OVER 40 YEARS  
GASOLINE • STEAM • ELECTRIC DRILLS  
WE PRE-GROUT SHAFT LOCATIONS  
HORIZONTAL DRILL HOLES FROM 3" TO  
16" FOR DEWATERING MINES  
OUR OPERATORS ARE HIGHLY SKILLED

WE HAVE ALWAYS  
GUARANTEED  
SATISFACTORY  
COAL CORES  
We solicit  
your inquiries

## CORE DRILLING

—anywhere



**PENNSYLVANIA  
Drilling Co.**

DRILLING CONTRACTORS AND MFRS.

1205 Chartiers Ave. Pittsburgh, Pa. WAlnut 1-5816



## Business Opportunity

## Strip Coal Wanted

Lease or purchase—large or small tracts, Morgan Coal Company, 2850 North Meridian Street, Indianapolis 8, Indiana.

## SALES ENGINEER

Salaried position for engineer experienced in ore dressing or coal preparation. Permanent position with leading equipment manufacturing and engineering construction firm. Submit details of experience, age, salary required and starting date. All replies strictly confidential.

P-5216 Coal Age  
520 N. Michigan Ave., Chicago 11, Ill.

## WANTED

Financial Backer with \$125,000 for 1/2 interest in 600,000 net tons capacity of yearly output washed bituminous coal Central Pennsylvania. A modern preparation plant on two railroads and extensive coal holdings are included.

BO 5096 COAL AGE  
330 W. 42 St., New York 36, N.Y.

Now on Sale  
"OUR CHRISTMAS DISASTER"

The story and the record  
of New Orient Mine Explosion  
December 21, 1951

Generously illustrated with  
pictures and maps.

By Mail Post-paid \$2.00 per Copy.

C. Edwin Hair  
Box 62, Benton, Illinois

BUYERS OF SURPLUS COPPER  
INSULATED WIRES AND CABLES

No lengths too long or too short  
Telephone: Eastgate 7-4778  
PIERCE CABLE CO.  
2664 Clybourn Ave. Chicago 14, Illinois

FOR SALE  
WIRE ROPE

2—1,250 Ft. Pcs. 1-3/4" Roebeling Locked Smooth  
Coil Track Strand Wire Rope for Aerial Tram-  
way. NEW—NEVER USED. Apply to THE SNAP  
CREEK COAL COMPANY, P.O. Box No. 1029, or  
Tel. 1533, Logan, West Virginia.

## FOR SALE

1—11 BU Joy Loading Machine, 4 years old, com-  
pletely overhauled, many spare parts included.  
1—2 AU Sullivan Coal Cutter, 4 years old, com-  
pletely overhauled, many spare parts included.  
2—two new bottom Sanford-Day Coal Cars.  
Other parts and equipment and supplies too  
numerous to itemize.  
Corona Coal Company Inc.  
Hepzibah, W. Va.

## MOTOR GENERATORS

- 1—500 KW G.E. Syn. 275 V. 900 RPM
- 1—400 KW G.E. Syn. 275 V. 720 RPM
- 1—300 KW G.E. Syn. 275 V. 1200 RPM
- 1—300 KW WEST. Syn. 275 V. 1200 RPM
- 1—300 KW RIDGWAY Syn. 275 V. 1200 RPM
- 1—200 KW RIDGWAY Syn. 275 V. 1200 RPM
- 1—150 KW WEST. Syn. 275 V. 1200 RPM
- 1—150 KW RIDGWAY Syn. 275 V. 1200 RPM

## ROTARY CONVERTERS

- 1—500 KW G. E. Syn. 275 V. 1200 RPM
- 1—400 KW WEST. Syn. 275 V. 1200 RPM
- 1—300 KW G. E. Syn. 275 V. 1200 RPM
- 1—300 KW AL-CH. Syn. 275 V. 1200 RPM
- 1—200 KW G. E. Syn. 275 V. 1200 RPM
- 1—150 KW G. E. Syn. 275 V. 1200 RPM
- 1—150 KW WEST. Syn. 275 V. 1200 RPM

## NEW G. E. RECTIFIER

- 1—200 KW G.E. Sealed Igniter Rectifier, Mining  
Stationary Type, 2500/4000 V. AC, 275 V. DC.  
Complete with AC Switchgear Cabinet, Rectifier  
Cabinet and DC Switchgear Cabinet. Equipment is  
thrust connected to the main 275 KVA Rectifier  
Transformer, Rectifier Model 28R40CAA30. Com-  
plete with water and air heat exchangers, Power  
Transformer and all other necessary accessories.  
Unit has never been in service.

## WALLACE E. KIRK COMPANY

501 GRANT BUILDING PITTSBURGH 19, PENNSYLVANIA  
A Quarter of a Century Serving Mining and Industrial Companies

## LOCOMOTIVES

- 2—30 T JEFFREY 250 V. 3-MH-77, 48-38" Ga.
- 1—23 T G.E. 300/250 V. 3-MH-824-A, 44-38" Ga.
- 1—20 T JEFFREY 250 V. 3-MH-77, 48-38" Ga.
- 1—20 T G.E. 250 V. (Tandem) WM-805, 38" Ga.
- 1—13 T JEFFREY 250 V. WM-110, 48-38" Ga.
- 1—13 T JEFFREY 500 V. WM-110, 48-38" Ga.
- 1—10 T JEFFREY 250 V. WM-2110, 48-38" Ga.
- 2—10 T JEFFREY 250 V. WM-110, 48-38" Ga.
- 1—10 T WEST 250 V. ML-907-C, 38" Ga.
- 2—10 T GOODMAN 250 V. 38-8, 38" Ga.
- 2—8 T JEFFREY 250 V. WM-100, 44-38" Ga.
- 2—8 T WEST 250 V. ML-908-C, 44-38" Ga.
- 1—8 T WEST 250 V. ML-923-LK, 34" Ga.
- 2—8 T JEFFREY 500 V. WM-88, 44-38" Ga.
- 2—8 T JEFFREY 500 V. WM-88, 44-38" Ga.
- 2—4 T GOODMAN 250 V. M8-4-E, 30-34" Ga.

## LOCOMOTIVE MOTORS

- 2—JEFFREY 250 V. WM-77, Ball Bearing
- 2—WEST 250 V. ML-908-C, Ball Bearing
- 2—WEST 250 V. ML-908-C, Ball Bearing
- 2—WEST 250 V. ML-908-C, Ball Bearing
- 2—G.E. 300/250 V. WM-824, Ball Bearing
- 4—WEST 80 V. V-49-X, Ball Bearing

Extra Armatures Available for Above Motors

## MOTOR GENERATOR SETS

- 750 KW AL-CH. 250 V. 720 R-Syn. 2500/440 V.
- 400 KW West. 350 V. 720 R-Syn. 2500/4000 V.
- 3—300 KW West. 275 V. 1200 R-Syn. 2500 V.
- 300 KW R.E. 275 V. 1200 R-MPC-AT1 2500/4000 V.
- 300 KW Rida. 275 V. 1200 R-Syn. 2500 V.
- 300 KW West. 250 V. 1200 R-Syn. 2500 V.
- 200 KW West. 275 V. 1200 R-MPC-AT1 2500/4000 V.
- 200 KW G.E. 275 V. 1200 R-MPC-AT1 2500/4000 V.
- 200 KW Rida. 275 V. 900 R-Syn. 2500 V.
- 200 KW West. 275 V. 900 R-Syn. 2500 V.
- 200 KW G.E. 125 V. 1200 R-MPC-AT1 2500/4000 V.
- 180 KW G.E. 275 V. 1200 R-MPC-AT1 2500/4000 V.
- 150 KW West. 275 V. 1200 R-Syn. 2500 V.
- 150 KW G.E. 350 V. 900 R-DLC-AT1 2500/4000 V.
- 100 KW Rida. 275 V. 1200 R-Syn. 2500 V.
- 100 KW Burke 250 V. 900 R-Syn. 250 V.
- 35 KW G.E. 125 V. 1750 R. DC-RT 220/440 V.
- 15 KW Ideal 125 V. 1750 R. D-A 220/440 V.

## ROTARY CONVERTERS

- 500 KW West. 275 V. 1200 R. 2500/4000
- 3—300 KW G.E. 250 V. MC78-1200R 15 200 V.
- 400 KW West. 250/125 V. 1200R. 15 800/2200/4000
- 2—300 KW AL-CH. 275 V. 1200R. 2500/4000 V.
- 300 KW G.E. 275 V. MC12-600 R. 2500/4000
- 200 KW G.E. 275 V. MC12-1200R. 2500/4000 V.
- 150 KW G.E. 275 V. MC12-1200R. 2500/4000 V.
- 150 KW West. 275 V. 1200R. 2500/4000 V.

Will rewind transformers to your specifications.

## MOORHEAD ELECTRICAL MACHINERY CO.

Mailing Address  
P. O. Box 7991C (Est. 1919)  
Pittsburgh 16, Penna.

Office and Shop  
Hobbsstown Road  
Oakdale, Penna.

## -TRANSFORMERS-



## BOUGHT AND SOLD

We carry a large stock of transformers, and invite your  
inquiries. New Transformers built to your specifications.

## PIONEER TRANSFORMER REBUILDERS

We rewind, repair and redesign all makes and sizes.  
One Year Guarantee.

## THE ELECTRIC SERVICE CO., INC.

"AMERICA'S USED TRANSFORMER CLEARING HOUSE"  
SINCE 1912 CINCINNATI 27, OHIO

## Magneto\* Telephones



Western Electric  
powerful 5 bar gener-  
ator wall telephone  
with french handset on  
side.

Unit refinished, tested  
& ready to talk

PRICE \$17.50

Bohnsack Equipment Co.  
GERMANTOWN, NEW YORK

## CLOSEOUTS GUARANTEED EQUIPMENT ---IMMEDIATE SHIPMENT BONDED SCALES

All scales complete with weighing beam and structural steel.

BONDED heavy duty motor truck scale, platform size 18' x 9', capacity 26 tons. A new scale guarantee. Priced at \$120.00 new, and it is offered for \$645.00.

New 30 ton scale with a 24' x 10' platform. Closing out this \$1300.00 value for \$950.00.

BONDED heavy duty scale, model 26208. In use less than 3 months. List price \$992.00. Platform 20' x 9'. Capacity 26 tons. New scale guarantee. Offered at \$725.00.

New 30 ton scale with 24' x 9' platform and used weighing beam. New guarantee, \$885.00.

BONDED 26 ton scale, 24' x 10', model 2624BW. New scale guarantee. Priced at \$1180.00 new. We offer it for \$825.00.

BONDED heavy duty motor truck scale, platform size 24' x 9', capacity 26 tons. List price is \$1135.00. Our price to you is \$795.00. New scale guarantee.

BONDED motor truck scale, model 4034BW, a 40 ton scale, with a 34' x 10' platform, regularly priced at \$2750.00. Offered with a new scale guarantee at \$1740.00, a saving of \$510.00.

BONDED heavy duty 26228 scale. Capacity 26 tons, with 22' x 9' platform. In use less than 6 months. New scale guarantee. Priced last at \$1060.00. This is a bargain at \$775.00.

### BONDED CRUSHERS

BONDED 1920C double-roll crusher with claw teeth. Roll size 19" x 20". These are the new type improved teeth for clean breaking with minimum of fines. Used only short time before trading in on larger model. New price \$1144.00. Priced to go at \$745.00, with new crusher guarantee.

BONDED 1216C crusher. Rolls 12" diameter, 16" long. Used less than one week. Designed for producing stoker coal. This is a trade-in that sold new for \$479.00, and is specially priced at \$395.00.

BONDED 1940DD crusher. Double roll, double-drive with claw teeth. Rolls 40" long, 19" diameter. Another trade-in on other Bonded equipment. Guaranteed same as new crusher. New price \$1483.00; offered subject to prior sale at \$1000.00.

BONDED 2816C crusher. Roll diameter 28"; roll width 36". Repossessed after 3 months. Sells new for \$1181.00; offered with new crusher guarantee at \$1799.00.

### BONDED VIBRATING SCREENS

Demonstrator of Bonded 35148 screen, 3 deck, 5' x 14', heavy duty eccentric shaft. Used only at machinery shops, etc. Some guarantee on new equipment. New ones cost \$5082.00, but you can have this for \$1550.00 including screen cloth to your specifications.

BONDED heavy duty screen, model 3388, 3 decks, 3' x 8'. Used for 3 months on sandstone screening, and so it's hardly had any load on it at all. Guaranteed same as new screen. You save over \$500.00 by buying this one. Screen cloth and all, for \$1300.00.

BONDED heavy duty screen model 2488, 2 decks, 4' x 8'. Traded in on longer screen. New equipment guarantee. A bargain at \$1385.00, complete with the screen cloth you need.

Model 138A Bonded screen. One deck, 3' x 8'. Another mining show and factory demonstrator. New equipment guarantee. \$787.00 new; will sell for \$515.00.

A BONDED screen very much like the 136A. Single deck, 3' x 6'. Equivalent to a new screen; used about 5 weeks, then repossessed. \$665.00 new; offered at \$475.00.

### PREVIOUS MODEL IDLERS BRAND NEW!

All steel troughing idlers and return rollers. Closing out to make way for new models. Prices have been cut 25%. Buy while they last at these new low prices.

3-roll Troughing Idlers for these sizes:  
14' belt ..... \$16.50 24' belt ..... \$18.75  
16' belt ..... 17.25 30' belt ..... 19.50  
18' belt ..... 18.00 36' belt ..... 20.25

24' belt ..... 42' belt ..... \$21.00  
1-roll Return Idlers for these sizes:  
14' belt ..... \$6.38 30' belt ..... \$8.25  
16' belt ..... 6.75 36' belt ..... 8.75  
24' belt ..... 7.50 42' belt ..... 9.50

48' belt ..... \$10.25

### Bonded Scale & Machine Co.

2190 S. Third Street Columbus, Ohio  
PHONES: GARfield 2186;  
FRanklin 6-8898, Evenings

## WE DID IT THE HARD WAY

Some folks spend millions on advertising and make a name for themselves almost over-night. We made our reputation the hard way—it took 25 years of buying and selling mining machinery, rails, copper wire, equipment, scrap iron and metals to teach folks to say: "You can always depend on

## J. T. FISH & COMPANY

Phone 2825

Logan, W. Va.

### CUTTING MACHINES

Goodman 212AA, 112AA, 12AA, 824BA

Jeffrey 35-L, 29-L, 29-C, 29-B

Shortwall, Arcwall & Slabbers

### CONVEYORS

Joy 20" Chain, Joy Ladel Shaker, Joy Belt

Feeder, Jeffrey 61 WH 15" Jeffrey Face 61

HC, Jeffrey 61 AM Room and Jeffrey 61

EW Elevating, Joy and Jeffrey Underground

30" Belt Conveyors, Conveyor Belting —

used 24" & 30".

### LOADING MACHINES

Joy low pedestal, Jeffrey 61 CLR, L-600, L-

400, Myers Whaley No. 3 Automats, latest

types, Quickway Shovel, Insley Crawler

Shovel.

### SUBSTATIONS

Motor Generators and Rotary Converters, 150

to 300 KW

Diesel Plants, 100 KW Superior.

G. M. C. 75 KW.

All 250 volts DC.

COPPER TROLLEY & FEEDER WIRE.

All sizes.

### LOCOMOTIVES

Jeffrey, Goodman, Westinghouse and General

Electric, 4 to 13 ton, single and tandem

units. All track gauges. 6 are low vein 22"

above rail, 2 Diesel 16 & 20 ton. 1 Gasoline

4 ton.

### MISCELLANEOUS

5000 Five Gallon Gas & Water Cans, 8 and

10,000 gallon Tank Car Tanks, 10 ton

Shepherd Bridge Crane complete with

structure, Coal Crushers, Vibrators, Loading

Booms, Air Compressors, Mine Pumps, Re-

laying Rail, Steel Mine Ties, Stationary

Motors, Spare Armatures of all kinds,

Transformers, Speed Reducers, Mine Scales,

Incline Hoists, New Westinghouse Tandem

Hydraulic Control Assembly for 6 to 10 ton

locomotive complete. Pipe Threading

Machines, Miscellaneous Shop Equipment, Je-

ffrey and Chicago Pneumatic Coal Drills.

### MINE CARS

All sizes Drop Bottom and End Dump 42" and

48" track gauge.

Thousands of Other Items, large and small.

## ROTARY CONVERTERS

Priced to today's mining conditions

200 Kw Complete . . \$5,950.00 Rebuilt

200 Kw, 1200 rpm, 275 volts DC, compound

wound, interpole, 6 phase, 60 cycle — com-

plete with AC-DC switchboards and 2300

volt primary rotary transformers.

Other sizes also in stock — or can furnish

rectifier or M-G set.

Send us your inquiry and receive a quotation

on a unit engineered and furnished to

meet your requirements.

R. H. Benney Equipment Co.

5024 Montgomery Road, Norwood 12, Ohio

Cincinnati Phone: MEtro 1108

### NEW AND REBUILT STORAGE BATTERY

## LOCOMOTIVES

1 1/2 to 10 Tons 15" to 54" Track Gauge.

GREENSBURG MACHINE CO.

Greensburg Pa.

### MACHINERY BARGAINS

Loading Machines:

—28BU Joy Loaders, 250 Volts, Rebuilt.

—12BU Joy Loaders, 250 Volts, Good Condition.

M. G. BFTS — Complete

—100 I—50 KW G. E. Sync., 2300-275 V. Rebuilt.

Crushers:

—10A48 Lish-Belt Double Roll, Bargain.

—10A18 Jeffrey Single Roll Removable Segments.

—10A14 Pennsylvania Bradford Brook.

Cutlery Machines:

—7AU Bellman Universal, Trunk Mounted, 250 V.

—10U Jeffrey Universal, 250 Volt.

—15B or BB Jeffrey Shortwall, 250 Volt — With

or without truck. Rebuilt.

Transformers:

—4-60 KVA Al-Ch, Single Phase, 23000 to 2300 V.

—10 KVA Park-Ed Si-Si Phase, 2200-275/480 V.

—30 KVA Allis-Chalmers Single Phase, 2200-

110/720 Volts, Slack.

—25 KVA G. E. Single Phase, 4160/7200 to

2300/4160 V.

TIPPINS MACHINERY CO.

Pittsburgh 6, Penna.

### FOR SALE

New 500 Gal. Skid Mounted

STORAGE TANKS

Shell of 1/2" Steel, 2" Outlet and 12"

Manhole in Top.

LEFTON INDUSTRIAL CORP.

212 Victor Street, St. Louis 41, Mo.

### Ironton

Electric Locomotives

New and used.

The Ironton Engine Company

Farmingdale, New Jersey

### FOR SALE

Williams 4-Ton Hammermill Coal Crusher with 38

HP A.C. Motor ..... \$1,398

Jeffrey 30" Flight Conveyor 25' Long ..... 1,200

EXCELLENT CONDITION

Prices low. Discardville, Indiana County, Pa.

Apply to Discardville Coal Company

401 U. S. Nat. Bank Bldg.

Johnstown, Pennsylvania

### SACRIFICE SALE

1—8 ton Goodman Locomotive

250 V-D.C. Type 132-A-0-A-C.

38" Gauge. Good condition.

Owner: Pawall Coal Company

232 N. 5th, Charleston, Iowa

Telephone: 978

### FOR SALE

150 MINE CARS

42" Gauge, 37" High, 2-Ton capacity,

Wooden End Dump, with 14" Watt Wheels,

Timken or Myatt Bearings. Cars in excel-

lent condition.

Columbia-Southern Chemical Corporation

Midvale Mine, Midvale, Ohio

## LOCOMOTIVES

- 4—10 ton Atlas, battery, 36" ga.
- 2—8 ton Goodman, battery, 36" ga., permissible type
- 2—8 ton General Electric, battery, 36" ga.
- 2—7 ton General Electric, battery, 36" ga., permissible type
- 3—6 ton Ironton, battery, 36" ga.
- 1—6 ton Atlas, battery, 36" ga.
- 1—4 ton Atlas, battery, 36" ga.
- 1—4 ton Mancha, battery, 24" ga.
- 1—2½ ton Jeffrey, battery, 36" ga.
- 1—2 ton Whitcomb, battery, 24" ga.
- 1—4½ ton Goodman, Trolley, 36" ga.
- 1—5 ton Jeffrey, trolley, 36" ga.
- 1—6 ton Goodman, trolley, 36" ga.
- 1—3 ton Whitcomb, gasoline, 24" ga.

## COAL CRUSHERS

- 1—24" x 24" Jeffrey Single Roll
- 1—24" x 36" McNally-Pittsburg Double Roll
- 1—30" x 45" Jeffrey Single Roll
- 1—36" x 40" Jeffrey Double Roll
- 1—36" x 48" Jeffrey Hammermill

## TUGGER &amp; SLUSHER HOISTS

- 2—5 HP Brownie Room Hoists
- 3—5 HP Sullivan RH single drum Room Hoists
- 1—7½ HP Sullivan double drum Slusher Hoist
- 2—10 HP Sullivan 3 drum Slusher Hoist
- 1—25 HP Sullivan 2 drum Slusher Hoist

## ELECTRIC HOISTS

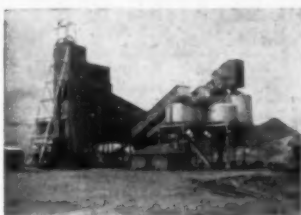
- 1—11 HP Vulcan #0 single drum
- 1—20 HP Vulcan single drum
- 1—22 HP Vulcan double drum
- 1—25 HP Vulcan single drum
- 1—30 HP Vulcan single drum
- 1—37 HP single drum
- 5—50 HP single drum
- 2—60 HP single drum
- 4—100 HP Box single drum
- 1—112 HP Vulcan single drum
- 1—145 HP Vulcan single drum
- 2—150 HP Vulcan single drum
- 1—375 HP Box single drum
- 1—600 HP Box single drum

## BOX CAR LOADERS

- 2—Ottumwa 20 HP Box car loaders
- 3—Maniere 22 HP Box car loaders
- 1—Jeffrey 20 HP Box car loader

## MINING MACHINES

- 2—78 Sullivan super short wall coal cutters
- 18—CE7 Sullivan coal cutters
- 1—CR3 Sullivan coal cutters
- 1—Jeffrey 28A coal cutter
- 6—Goodman 112-A coal cutters
- 1—Sullivan CH-11 ironclad shearing machine
- 1—Jeffrey 29-C Arcwall coal cutter



## LOADERS &amp; CONVEYORS

- 2—8BU Joy loaders
- 2—61EW Jeffrey elevating chain conveyors
- 1—61HG Jeffrey chain conveyor, 90'
- 1—61W Jeffrey chain conveyor, 200'
- 9—G-20 Goodman shaker conveyors
- 10—G-15 Goodman shaker conveyors
- 8—Vulcan shaker conveyors
- 2—Joy ladel UN-17 shaker conveyors
- 10—Goodman HA duckbills

## MINE FANS &amp; BLOWERS

- 2—8-H Jeffrey 42" Aerodyne Fans
- 1—Jeffrey 8 x 4 Fan
- 5—Jeffrey AGI exhaust blowers
- 6—Jeffrey Aerodyne midjet permissible blowers
- 3—Jeffrey Aerodyne midjet blowers

## SCALES

- 1—100 ton Fairbanks railroad scale
- 1—100 ton Howe railroad scale
- 1—125 ton Howe railroad scale
- 1—20 ton Fairbanks springless dial type truck scale
- 1—5000# Fairbanks Tipple scale with weighing basket
- 1—5000# Howe Tipple scale

## STORAGE BINS

- 3—50 ton capacity steel bins
- 2—100 ton capacity steel bins

## TIPPLE EQUIPMENT

- 1—4 deck shaker screen 32' long in 2 sections, driven by 10 HP & 25 HP motors
- 1—4 deck card shaker screen, 18' long, driven by 50 HP motor
- 1—Card rotary car dumper
- 1—Link Belt bucket elevator, 50' centers, 18" x 10" x 9" buckets
- 1—Link Belt bucket elevator, 50' centers, 10" x 6" x 6" buckets
- 1—Link Belt bucket elevator, 60' centers, 6" x 4" x 4" buckets

- 1—Jeffrey picking table, 19' centers, 36" wide
- 1—Jeffrey picking table, 19'8" centers, 36" wide
- 1—Jeffrey Drag Conveyor, 88'6" centers, 36" flights
- 1—Jeffrey Drag Conveyor, 72' centers, 30" flights
- 1—Jeffrey Drag Conveyor, 67' centers, 30" flights
- 1—Jeffrey Drag Conveyor, 69'6" centers, 28" flights
- 1—Link Belt Drag Conveyor, 50' centers, 15" flights
- 1—32" x 9'6" Card vibrating screen
- 1—4' x 6'6" Link Belt jig washer
- 1—Loading boom, 32'3" centers, 24" flights with 8' grizzly
- 1—Loading boom, 55' centers, 48" flights
- 1—Loading boom, 45' centers, 30" flights
- 2—Card self dumping mine cages
- 2—Card 84" bicycle sheave wheels
- 1—24" Belt conveyor, 40' centers
- 1—24" Belt conveyor, 13' centers
- 1—24" Belt conveyor, 135' centers
- 1—24" Belt conveyor, 66' centers
- 1—30" Belt conveyor, 173' centers
- 1—Red Devil egg loader, 16" flights
- 1—Ottumwa nut loader, 16" belt

## ELECTRIC CABLE

- 12400#—weatherproof single conductor wire, 350000 CM
- 3600'—300000 CM wire
- 16600'—#4 rubber covered single conductor, 600V
- 3800'—#5 Parkway cable, 3 con., 7200 volt
- 2977'—#8 Parkway cable, 3 con., 7200 volt
- 1368'—#10 Parkway cable, 3 con., 7200 volt
- 547'—#2 3-conductor Tires, 600 volt
- 3400'—#6 3 con., Tires, 600 volt
- 1000'—#12 4-con., Tires, 600 volt
- 12700'—1/0 rubber covered 1 con., 600 volt
- 3842'—#2 solid bare copper hard drawn
- 1725'—#4 solid bare copper hard drawn
- 6000'—1/0 solid bare copper hard drawn

## PIT CARS

- 125—60 cu. ft. Card steel coal mine cars, 36" ga.
- 88—66 cu. ft. Card steel coal mine cars, 36" ga.

## RAIL

- 16, 20, 30, 40, 52, 60, and 80# relaying rail in stock

## TIPPLES

- 2 complete tipple buildings and machinery, each capable of 1000 to 1500 tons per day production

*Send for free copy of illustrated booklet describing the famous Allen Lamp collection.*

**MORSE BROS. MACHINERY CO.**

2900 BRIGHTON BLVD.

EST. 1898

DENVER 1, COLO.

## ARE YOU LOOKING FOR RELAYING RAIL?

We have in stock for spot shipment . . .

6 tons	8 to 16#	Relaying Rails *
13 tons	20#	New Rails
27 tons	40#	Relaying Rails *
40 tons	45#	Relaying Rails *
20 tons	50#	Relaying Rails *
250 tons	65#	Relaying Rails
800 tons	70#	Relaying Rails
670 tons	75#	Relaying Rails *
112 tons	80#	Relaying Rails *
1800 tons	85#	Relaying Rails *
635 tons	90#	Relaying Rails *
500 tons	131#	Relaying Rails *
10 tons	133#	Relaying Rails *

\* With matching angle bars

## THE PURDY COMPANY

8754 Dobson Avenue, Chicago 19, Illinois

BAyport 1-2100

BRANCH OFFICES • New York • So. San Francisco • St. Louis

PLANTS: Chicago, Illinois • Burnham, Illinois • Wildwood, Illinois  
Youngstown, Ohio • So. San Francisco, Calif. • St. Louis, Mo.

## EQUIPMENT FOR SALE

LIST #8652

- 1—Vulcan Shaft Hoist, complete with 350 H.P. Motor, control equipment. Complete description furnished on request.
- 1—200 K.W. Ridgway M.G. Set, 550 V. D.C., 4160/2200 V. A.C., complete with switch-board equipment.
- 5—Goodman G15 Shaker Conveyor Drives, with 15 H.P., 250 V. D.C. Motor, starter and locks included.
- 3—Goodman ELG16 Duckbill units, complete.
- 2—Goodman "Yo-Yos" (used on discharge end of 97HC30 belt conveyors)
- 2—Goodman 4248J Permissible track-mounted Mining Machines complete, 42" gauge, 250 Volt D.C., 9 H. Cutter Bar. Dimensions: 30" ht., 6 ft. width, lgh. 26 ft. Also spare complete cutting motor, assemblies and parts.
- 1—Mines Equipment Co. Type 24 Bit Heater with Oil Burner and Blower; complete (new and never used)
- 3—U-267-1AE Jay-Kellogg Tire Pump Compressors, 250 V. D.C. Complete
- 3—General Electric Co., 100 K.V.A., 1 phase, 60 cycle, Transformers, outdoor oil type. High voltage 4160, Low voltage 460/230.
- 1—General Electric Co. Auto-transformer, 3 phase, 60 cycle, Output 150 KVA, 4000 Volt V to 2300 Volt V.
- 1—General Electric Co. transformer, 100 K.V.A., 3 phase, double wound, 4000 volt primary, 2300 volt secondary, 60 cycle.

The Valley Camp Coal Co.

P. O. Box 2008, Elm Grove, W. Va.

E. Braun, Maintenance Department

Telephone — Triadelphia 2010

## STOCK SHIPMENT

## BRAND NEW

Explosion Proof Motors

220/440/60/3

QUAN.	H. P.	R.P.M.	MAKE	FRAME
54	1	1800	West.	203
29	1	1200	West.	204
3	1 1/2	900	Al. Ch.	214
1	1 1/2	720	West.	214
32	2	1800	West.	224
34	2	1200	West.	225
9	3	3600	G. E.	224
42	3	1800	West.	225
23	3	1200	West.	138
33	5	1800	West.	234
24	5	1200	West.	284
16	7 1/2	1800	West.	284
15	7 1/2	1200	West.	324
9	10	1800	West.	324
15	10	1200	West.	326
20	15	1800	West.	326
13	15	1200	West.	364
15	20	1800	West.	364
8	20	1200	West.	365
1	20	600	West.	404
7	25	1800	West.	364
8	25	1200	West.	404
2	25	600	West.	405
23	30	1800	Huall	404
1	30	1200	West.	405
10	40	1800	West.	405
6	50	1800	West.	444
4	50	1200	West.	445
4	75	1800	West.	504
1	75	1800	L. A.	505
1	75	1800	Refume	504
1	75	1200	West.	505
1	75	600	West.	607
2	100	1800	West.	505
2	100	1200	West.	607
1	100	600	West.	772
1	125	3600	G. E.	63262

SEND US YOUR INQUIRIES

Write, Wire or Phone LD 132

AJAX

Electric Motors Corp.  
1138 Mt. Hope Avenue  
P. O. Box 262  
Rochester 1, N. Y.

MOTORS—CONTROLS—TRANSFORMERS

## STRIPPING SHOVEL FRONT 2 C. Y.

30' 6" Boom, 27' 6" Square Stick  
OFF LORAIN 820

Can be used on Lorain 79-80-82-8201

Used app. 4 months—like new

Replacement price \$15,000 SACRIFICE \$7500

CHENICO COMPANY

145 West 63 St., N.Y.C., N.Y. MUrrihill 5-6828

## IMMEDIATE SHIPMENT

## RAILS

NEW  
RELAYINGSWITCH MATERIAL  
ALL TRACK ACCESSORIES

## MIDWEST STEEL CORPORATION

Charleston 21, W. Va.

RAILS *New and Relaying*TRACK MATERIALS AND  
ACCESSORIES  
CARRIED IN STOCKSWITCH MATERIAL •  
SPIKES • BOLTS •  
TRACK TOOLS • TIES  
• TIE PLATES • BUMP-  
ERS • COMPLETE SIDE  
TRACKSBUILDERS STEEL SUPPLY CO.  
4201 WYOMING • P.O. Box 188 • DEARBORN, MICH.

## NEW RAILS RELAYING

All sections of rails and good serviceable second  
hand cars, all gauges, also spikes, bolts, fraps,  
switches, line and cars.

M. K. FRANK

400 Lexington Ave.  
New York, N. Y.401 Park Bldg., Fifth Ave.  
Pittsburgh 22, Pa.  
Carnegie, Pa.90 lb. Relaying Rail & Fittings — Approx-  
imately 350 tons. Dismantling the Ashland  
Branch of the Lehigh Valley Railroad.

Contact:

INDUSTRIAL DISMANTLING  
& SALVAGE CO.

Box 332 Ph: 8254 Easton, Pa.

FOR SALE  
GUARANTEED A-1  
RECONDITIONED COAL  
MINING EQUIPMENT

Goodman 360 Loaders

Goodman G20B77 Shaker Conveyors

Sullivan 7AU Cutting Machines

CPT574 Post Mounted Drills

New spare parts for all of the above  
equipment at substantial savings.KAISER STEEL CORPORATION  
SUNNYSIDE, UTAHGM  
SERIES  
71DIESEL  
PARTSLINER KITS—LINERS  
PISTONS—RINGS—PINS  
MAIN and CONN. BEAR-  
INGS—EXHAUST VALVES  
INSERTS—GASKET SETS  
LO and FO ELEMENTS

Prices on Request

W.R.  
BLACKBURN & CO.  
149E BROADWAY  
NEW YORK 6, N. Y.







# COAL AGE ADVERTISERS IN THIS ISSUE

MORE INFORMATION on any product advertised in COAL AGE  
may be easily secured by using the postage-free card facing p. 125.

*Allen & Garcia Co.	123	Gulf Oil Corp.	37	*Twin Disc Clutch Co.	160
*Allis-Chalmers Mfg. Co.	19, 47, 146	Gulf Refining Corp.	37	United Engineers & Constructors, Inc.	135
*Allis-Chalmers Tractor Div.	8-9	Guayana Machinery Co.	208	United States Rubber Co.	131, 198
*American Brattice Cloth Corp.	184	*Hazard Insulated Wire Works.	145	*United States Steel Co.	156-157
American Cable Div.		Harnischfeger Corp.	65	*United States Steel Supply Div.	156-157
American Chain & Cable Co.	Third Cover	*Hendrick Mfg. Co.	218	*United States Steel Export Co.	156-157
*American Car & Foundry Co.	Second Cover	Hoffman Bros. Drilling Co.	182		
*American Cyanamid Co. (Expt. Dept.)	143	Holmes & Bros., Inc., Robt.	38		
*American Hoist & Derrick Co.	216	Homer Bros., Inc.	218		
*American Manganese Steel Div.		Hubbard Bros. Co.	191		
American Wire & Cable Co.	204	Hulburt Oil & Grease Co.	2-3		
*American Mine Door Co.	217	Hy-Test Safety Shoes, Div. of			
*American Pulverizer Co.	189	International Shoe Co.	67		
American Steel & Wire Div.	156-157				
Anaconda Wire & Cable Co.	17	*Indiana Foundry Co.	218		
Armco Drainage & Metal Products, Inc.	175	International Harvester Co.	159		
Armstrong-Bray & Co.	208	Iowa Mfg. Co.	24		
*Ashland Oil & Refining Co.	57, 186				
*Atlas Car & Mfg. Co.	189	*Jeffrey Mfg. Co.	10-11, 34-35		
Atlas Powder Co.	62-63	*Johns-Manville	109		
Aurora Pump Co.	217	*Jones Foundry & Machine Co., W. A.	167		
		*Jones & Laughlin Steel Corp.	161		
		*Joy Mfg. Co.	171		
			Insert between pp. 20-21, 33, 139, 218		
*Baldwin-Lima-Hamilton Corp.		*Kennametal, Inc.	119		
Construction Equipment Div.	173	Koehring Co.	110-111		
*Bemis Bro. Bag Co.	172				
Bethlehem Steel Co.	22, 32, 66	LaPlant Choate Mfg. Co.	133		
*Bird Machine Co.	4	*Laughlin Co., Thomas	195		
*Bituminous Casualty Co.	213	LeRoi Co., Cleveland Rock Drill Div.	40-41		
*Blaby-Zimmer Engrs. Co.	178	LeTourneau, Inc., R. G.	12-13		
*Blackhawk Mfg. Co.	210	*Lee Norse Co.	147		
Boston Woven Hose & Rubber Co.	46	Lincoln Engrs. Co.	203		
*Bowditch Co.	26	*Link-Belt Co.	212, 213, Fourth Cover		
Bucyrus-Erie Co.	36A	*Long Super Mine Car Co.	198		
Campbell Co., E. K.	152	Macchlyte Co.	61		
Cardox Corp.	58-59	Manheim Mfg. & Belling Co.	170		
*Carlon Products Corp.	42	McGraw-Hill Book Co.	170		
Caterpillar Tractor Co.	20	Moore Co.	168		
Central Mine Equipment Co.	51	*Myers-Whaley Co.	60		
Chevrolet Div., General Motors	202				
Cincinnati Mine Machinery Co.	193	National Electric Coil Co.	179		
*Cities Service Oil Co.	137	*National Malleable & Steel Castings Co.	185		
*Coffing Host Co.	213	*National Mine Service Co.	49		
*Colliery Insulated Wire Co.	211	National Tube Div.	156-157		
*Colorado Fuel & Iron Co.	Insert between pp. 52-53	*Nolan Co.	168		
*Columbia-Geneva Steel Div.	156-157	Norton Co.	214		
*Connellville Mfg. & Mine Supply Co.	197				
*Continental Gin Co., Industrial Div.	132	Ohio Brass Co.	115		
Compton, Inc.	44-45	*Oliver United Filters, Inc.	52		
*Crane Co.	209	*Osmose Wood Preserving Co. of America	188		
*Cummins Engine Co.	199				
		Pangborn Corp.	181		
*Davis Co., Nelson L.	144	Paris Mfg. Co.	28		
*Denver Equipment Co.	64	Pennsylvania Drilling Co.	218		
*Detroit Diesel Engine Div., General Motors	121	Peterson Filters & Engineering Co.	149		
*Differential Steel Co.	121	Pittsburgh Gear Co.	216		
Dodge Div., Chrysler Corp.	116A	Plastex Pipe & Extrusion Co.	210		
Dodge Mfg. Corp.	36	Plymouth Rubber Co.	214		
*Dorr Co.	207	Pure Oil Co.	201		
duPont de Nemours & Co., E. I.					
(Explosives Dept.)	169	*Remaly Mfg. Co., Inc.	172		
Duff-Norton Mfg. Co.	150	Roebling's Sons Co., John A.	121		
Durakool, Inc.	182	*Rome Cable Co.	140-141		
		Rust-Oleum Corp.	163		
Eaton Mfg. Co.	Insert between pp. 116-117	*Salem Tool Co.	154-155		
*Eimco Corp.	18	*Sanford Day Iron Works	14-15		
*Electric Storage Battery Co.	166	*Schramm, Inc.	191		
*Emmigh-Bickford Co.	68	Searchlight Section	219-223		
Ensign Electric Co.	213	*Simplex Wire & Cable Co.	29		
		*Sinclair Refining Co.	183		
Fairbanks, Morse & Co.	52A	Socony-Vacuum Oil Co.	177		
*Fairmont Machinery Co.	153	Standard Oil Co. (Indiana)	125		
*Firth Sterling Steel & Cable Corp.	103	Stearns Magnetic, Inc.	162		
*Flexible Steel Lacing Co.	217	Steads Co.	180		
*Flood City Brass & Electric Co.	192	Stolz-Sickles Co.	187		
*Foote Gear Works, Inc., Brad.	190	Sun Oil Co.	126		
*Foster Co., L. B.	208	Syntrom Co.	149		
Gates Rubber Co.	53	*Tennessee Coal & Iron Div.	156-157		
*General American Transportation Corp.	56	Texas Co.	6-7		
*General Electric Co.	16, 224	*Thermoid Co.	151		
(Construction Materials Div.)	50	Thurman Machine Co., Scale Div.	212		
General Tire & Rubber Co.	43	Tide Water Associated Oil Co.	171		
*Goodman Mfg. Co.	39	*Timken Roller Bearing Co.	25		
Goodrich Co., B. F.	1, 107	*Tool Steel Gear & Pinion Co.	133		
Goodyear Tire & Rubber Co.	23, 27		Insert between pp. 36-37		
*Gorman-Rupp Co.	164				
Gould National Batteries, Inc.	113				
Greensburg Machine Co.	215				

## The Renewal Parts Picture...

① ... TO THE PURCHASING  
AGENT MEANS GETTING  
YOUR MONEY'S WORTH.

③ OR LOSE MONEY  
WHEN THEY DON'T.

⑤ GIVE YOU  
THE MOST FOR  
YOUR RENEWAL  
PARTS DOLLAR!

② TAKE GEARS OR  
PINIONS-MINE  
LOCOMOTIVES EARN  
WHEN THEY WORK...

④ G-E OF COURSE...  
BUT HE KNOWS THAT  
GENUINE GEARS AND  
PINIONS FOR  
G-E EQUIPMENT...

MORAL: G-E EQUIPMENT WORKS BETTER,  
LASTS LONGER WITH GENUINE G-E PARTS

GET THE FACTS! Write for bul-  
letin GEA-1054R, "Pinions &  
Gears for Transportation Equip-  
ment," Section A128-2, General  
Electric Co., Schenectady 5, N. Y.

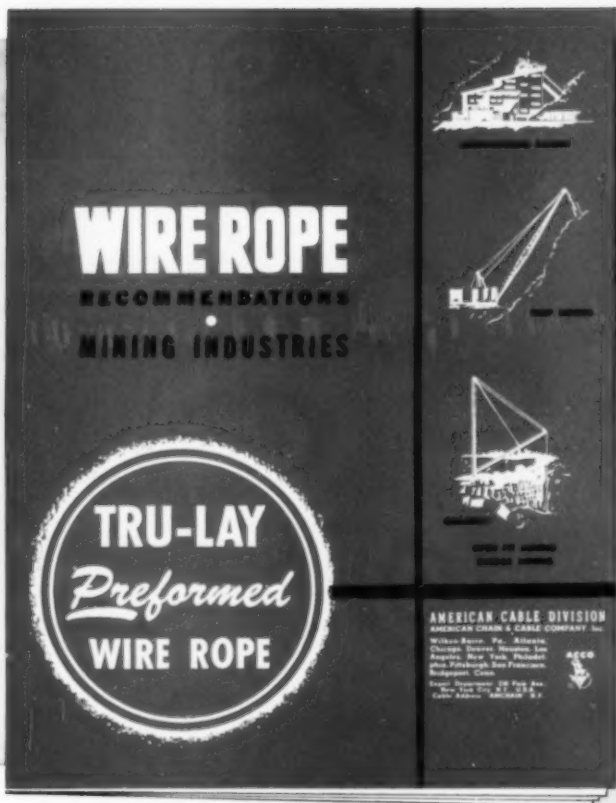
**GENERAL ELECTRIC**

\* Indicates that detailed information may be found in the 1951-1952 MINING CATALOGS.

This index is published as a convenience to the reader. Every care is taken to make it accurate, but C. A. assumes no responsibility for errors or omissions.



Here's a  
**NEW**  
Booklet  
that takes  
guesswork  
out of the  
selection of  
Mining Ropes



● With AMERICAN CABLE'S new wire rope recommendation booklet you see illustrations of various types of mining equipment. Then you look across the page at the listings, and there you find a complete description of the rope you need. Pages are 8½" x 11", the type is large and easy to read.

Here is the best wire rope recommendation book ever made for mining equipment. The recommendations are up-to-date and based on the successful use of TRU-LAY Preformed and other American Cable wire ropes over a long period of time.

Get a copy from your American Cable distributor or use coupon today.

**ACCO**



**AMERICAN CABLE DIVISION  
AMERICAN CHAIN & CABLE**

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York,  
Odessa, Tex., Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

American Cable Division,  
American Chain & Cable,  
Wilkes-Barre, Pa.

CA-2

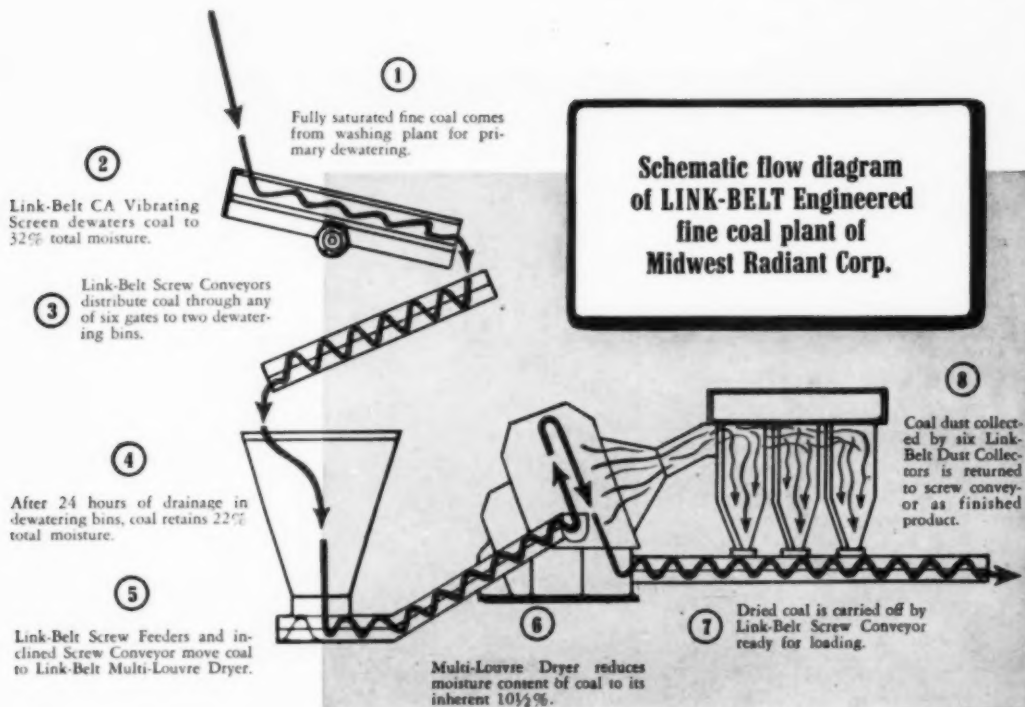
Please send DH-128-A "Wire Rope  
Recommendations for Mining Industries."

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

ADDRESS \_\_\_\_\_

TOWN \_\_\_\_\_ STATE \_\_\_\_\_



## Recovers 100 tons of fine coal daily!



Note the fine particle size of the coal as it is delivered to the Link-Belt Screw Conveyor by CA Concentric Action Vibrating Screen.

Coal moves from drainage tanks (extreme left) via L-B Screw Conveyors to Multi-Louvre Dryer. All surface moisture is removed, and finished product is joined by dust from six L-B Dust Collectors. Other L-B equipment: P.I.V. Variable Speed, Herringbone Gear and Roller Chain drives, RC Flexible Couplings.

WHEN a coal mine finds a way to market 100 tons of coal per day that was formerly wasted, it makes a big difference in their profit picture. That's exactly what happened when Midwest Radiant Corp. put their Link-Belt-engineered fine coal plant at Millstadt, Ill., into operation.

Moisture is removed from sludge tank coal by the fast, gentle action of a Multi-Louvre Dryer and auxiliary Link-Belt equipment. One man operates the entire plant from a central control panel.

If you're planning changes in your preparation plant, Link-Belt engineering may show you the way to similar benefits. Link-Belt welcomes the opportunity to undertake full responsibility for engineering, manufacture, erection and performance of complete coal preparation plants.

# LINK-BELT

COAL PREPARATION and HANDLING EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Philadelphia 40, Pittsburgh 13, Wilkes-Barre, Huntington 9, W. Va., Louisville 2, Denver 2, Kansas City 8, Mo., Cleveland 15, Indianapolis 6, Detroit 4, Birmingham 3, St. Louis 1, Seattle 4, Toronto 8, Springs (South Africa).